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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup>:</b> <b>G06F</b>	<b>A2</b>	<b>(11) International Publication Number:</b> <b>WO 00/54122</b> <b>(43) International Publication Date:</b> 14 September 2000 (14.09.00)
<b>(21) International Application Number:</b> PCT/US00/03526 <b>(22) International Filing Date:</b> 10 February 2000 (10.02.00) <b>(30) Priority Data:</b> 09/265,147 9 March 1999 (09.03.99) US <b>(71) Applicant:</b> ANCESTRY.COM, INC. [US/US]; 266 West Center Street, Orem, UT 84057 (US). <b>(72) Inventors:</b> TAGGART, Daniel, D.; 10457 N. 6300 W., Highland, UT 84003 (US). ALLEN, Paul, B.; 1791 N. 500 E., Provo, UT 94604 (US). REDD, Brandt, C.; 2125 N. 1450 E., Provo, UT 94604 (US). <b>(74) Agents:</b> GIBBY, Darin, J. et al.; Townsend and Townsend and Crew LLP, 8th floor, Two Embarcadero Center, San Francisco, CA 94111 (US).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>
<b>(54) Title:</b> SYSTEM AND METHODS FOR SHARED ELECTRONIC PURCHASING  <b>(57) Abstract</b>  Systems and methods are provided for facilitating a purchase transaction. According to one method, multiple proposed contributions towards a purchase price of an item using multiple payment instruments are collected at a merchant server computer. The merchant server computer sends requests for authorization to charge the payment instruments. The merchant server computer collects the returned responses to the authorization requests. The merchant server computer then sends commands to charge all of the payment instruments only if the responses indicate an authorization to charge all of the payment instruments.		

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## SYSTEMS AND METHODS FOR SHARED ELECTRONIC PURCHASING

### BACKGROUND OF THE INVENTION

The invention relates generally to the field of sales, and in particular to sales at the retail level. More specifically, the invention relates to systems and methods for facilitating the purchase of retail items that are purchased from contributions made from one or more individuals using one or more forms of payment.

Retail sales are an important part of the economy. For example, the value of total retail sales in 1998 is expected to exceed \$100 billion. Gift giving accounts for a large percentage of retail sales, particularly of new and high-end goods. One emerging way to purchase retail goods is using the Internet. Indeed, Newsweek magazine recently reported that an estimated \$2.3 billion will be spent by Americans on Web gifts during 1998. This amount is double that spent during 1997.

One popular way to give a gift is to solicit contributions from several people so that resources can be pooled to purchase a more expensive gift. Typically this is done by all the contributors giving money to one designated buyer who purchases the item and delivers it to the recipient. This practice is common within families where the majority of gift giving typically occurs. For example, if a sibling is to be married, the other siblings may wish to join together to purchase a wedding gift, such as a television. Usually, one of the siblings then has the responsibility of contacting the other siblings, requesting a donation amount, following through to make sure that sufficient contributions are received, and then purchasing the television, preferably all before the wedding day. As this example illustrates, gift giving by seeking contributions can be fraught with problems. For example, contacting each of the proposed contributors can

be difficult, especially if the contributors are separated by long distances. To contact each of the contributors, a long distance telephone call or a letter may need to be written. This can be both time consuming and expensive. Further, collecting money from each of the proposed contributors can also be difficult. For example, the designated buyer will typically be unable to use the credit cards of the proposed contributors because the designated buyer is typically not included on the account. Hence, receiving payment authorization for the credit cards will be difficult if not impossible. Use of cash is typically discouraged because of the lack of security in transferring the cash through the mail system. Still further, once all of the contributions have been collected, the primary buyer then has the responsibility of selecting the desired item, purchasing the item and then providing it in suitable form to the recipient.

In summary, existing processes for gift giving when multiple contributions are sought are inefficient. More specifically, existing processes are both time consuming and have high transaction costs. Further, existing processes are inconvenient, particularly for the designated buyer who has the responsibility of coordinating gift selection, contribution amount, contribution collections and delivery.

Hence, it would be desirable to provide systems and methods to facilitate the purchase of items when soliciting contributions from one or more contributors using one or more forms of payment. The systems and methods should be both efficient and easy to use. Preferably, the systems and methods will utilize computers which are coupled to a network, such as the Internet, to reduce the transaction costs involved in the purchasing process.

#### SUMMARY OF THE INVENTION

The invention provides exemplary systems and methods for facilitating purchase transactions. More specifically, the methods and systems of the invention are employed to facilitate the sale of items where one or more contributions are made toward the purchase price of the item. The systems

and methods of the invention are particularly useful when the proposed contributions are made using one or more forms of payment.

5 According to the invention, techniques are provided for synchronizing multiple charges (from multiple contributors) to multiple payment instruments when purchasing an item. According to one exemplary method, multiple proposed contributions toward the purchase price of an item using multiple payment instruments are collected. Preferably, the  
10 contributions are collected at a merchant server computer. The merchant server computer then sends requests for authorizations to charge the payment instruments. Typically, these requests will be sent to banks or other credit organizations who have authority to charge the payment  
15 instruments. The merchant server computer then waits for returned responses to the authorization requests. If the responses indicate an authorization to charge all of the payment instruments, the merchant server computer sends out commands to charge all of the payment instruments. However,  
20 if any one of the responses indicates a failed authorization, then none of the payment instruments are charged. In this way, charging of the payment instruments is synchronized so that none of the payment instruments will be charged unless the authorized charges are sufficient to cover the purchase  
25 price of the item.

The merchant server computer is preferably coupled to a network to which various other computers are also coupled. In one particular aspect, the item that is desired to be purchased is selected from a primary buyer computer  
30 which is coupled to the network. The selection of the item is then sent over the network to the merchant server computer. The selection of the item is then sent to one or more co-payer computers over the network along with a request to contribute toward the purchase price. Preferably, the primary buyer  
35 identifies the co-payers who may wish to contribute toward the purchase price. Conveniently, the primary buyer may also compose a solicitation letter at the primary buyer computer which contains a request for a contribution towards the

purchase price. This information is then sent over the network to the identified co-payer computers. After the co-payers have read the solicitation letter, responses to the letter are sent over the network to the merchant server  
5 computer, with the responses preferably indicating a proposed contribution towards the purchase price.

In another particular aspect, a notification is sent over the network to the primary buyer computer when the contributions from the co-payers meet or exceed the purchase  
10 price. The primary buyer is then able to confirm the selection from the primary buyer computer.

In still another aspect, once the primary buyer computer has confirmed that the item should be purchased, the merchant server computer sends a request to banks or credit  
15 organizations asking for authorizations to charge the payment instruments as previously described. The merchant server computer then collects the returned responses and sends commands to charge all of the payment instruments only if the responses indicate an authorization to charge all of the  
20 payment instruments. Once all of the payment instruments have been charged, the item has been purchased and is sent to an indicated recipient.

The invention further provides an exemplary system for facilitating a purchase transaction. The system comprises  
25 at least one network server computer which may be coupled to a network to allow the network server computer to communicate with a primary buyer computer and one or more co-payer computers. The system includes code to present a list of inventory items at the primary buyer computer. In this way, a  
30 primary buyer may utilize the primary buyer computer to select one of the items to purchase at a given purchase price. The system further includes code to send a message to the co-payer computer requesting whether contributions are to be made toward the purchase price of the item using a given payment  
35 instrument. Code is also included to determine when one or more proposed contributions toward the purchase price meets or exceeds the purchase price. Still further, the system includes code to send a command to charge the payment

instruments to pay the purchase price. In this way, once the network server computer receives proposed contributions which meet or exceed the purchase price, commands are sent to charge the payment instruments to pay the purchase price.

5 In one particularly preferable aspect, the network server computer is also configured to be coupled to at least one credit organization which has authority to charge the payment instruments. The system preferably also includes code to contact the credit organization to authorize the charging  
10 of the payment instruments. The system preferably also includes code to send commands to the credit organizations to charge the payment instruments only after receiving authorizations from the credit organizations to charge all of the payment instruments. In this way, the payment instruments  
15 will not be charged unless all of the charges are preauthorized.

In another particular aspect, the system includes code to send over the network a notification to the primary buyer computer of any proposed contributions. A notification  
20 is preferably also sent over the network to the primary buyer computer when the proposed contributions meet or exceed the purchase price. Still further, this system preferably includes code to send a confirmation of the selection from the primary buyer computer to the network server computer to allow  
25 the primary buyer to confirm that the item is still desired to be purchased. Optionally, the primary buyer may also wish to contribute towards the purchase price. This may be done by sending a proposed contribution from the primary buyer computer to the network server computer.

#### 30 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram of an exemplary system to facilitate a purchase transaction according to the invention.

35 Fig. 2 illustrates a flowchart outlining the steps of an exemplary method for facilitating a purchase transaction using the system of Fig. 1 according to the invention.

Fig. 3 illustrates a flowchart outlining an exemplary refunding processing according to the invention.

#### DETAILED DESCRIPTION OF THE SPECIFIC EMBODIMENTS

5 In a broad sense, the invention provides for the synchronization of multiple charges to multiple payment instruments. In this way, none of the payment instruments will be charged until all of the proposed charges are authorized. Once all the authorizations are received, the invention  
10 provides for the charging of each of the payment instruments.

The techniques of the invention will find their greatest use in facilitating the purchase of items where contributions are received from multiple individuals using multiple forms of payment instruments. Typically, the items  
15 to be purchased will be those sold at the retail level, including clothing, footwear, consumer durable goods, jewelry, toys, food, parts, and the like. However, it will be appreciated that the invention is not limited to the particular type of item that is to be purchased.

20 As just described, one important feature of the invention is the ability to synchronize multiple charges to multiple payment instruments. The types of payment instruments that may be used with the invention include credit cards, debit cards, negotiable instruments such as checks,  
25 prepaid accounts, smart cards, utility bills, credit accounts, billing services, electronic funds transfer, bank accounts, brokerage accounts, and money market funds. and the like. Of these, the invention will find its greatest use when the form of payment instrument is a credit card.

30 The standard practice among credit card companies is to utilize a two-step process in handling payments. The first step is payment authorization. When a payment is authorized, the designated amount of funds is reserved on the card but no actual transfer of money occurs. The second step is payment  
35 settlement. In this step, the card is actually charged and the money is transferred to the payee's account. The present invention takes advantage of this two-step process to help insure that none of the cards are charged until an



authorization is received for each of the cards. If any of the cards receives a failed authorization, then none of the cards are charged. In this way, the synchronization of charges to multiple cards is provided.

5           The techniques of the invention preferably utilize modern computer technology. More specifically, the methods of the invention are preferably practiced utilizing various computers which are able to communicate with each other over a network. For example, one configuration of a system 10 that  
10   may be employed to implement the techniques of the invention is illustrated in Fig. 1. System 10 preferably employs the use of a primary buyer computer 12 and one or more co-payer computers 14. Computers 12 and 14 may be of any type of computer that will support a Web browser, including any one of  
15   a variety of commercially available personal computers, such as those employing a Pentium-type processor. Merely by way of example, such computers can include desktop computers, workstations, laptop computers, Web TV devices, hand-held devices, and the like. As such, the invention is not limited  
20   to the particular type of computer needed to implement the methods of the invention.

Computers 12 and 14 may be constructed to be essentially identical to each other and preferably each comprises a processor chassis 16 within which is disposed a  
25   central processing unit (CPU) and supporting integrated circuitry. Coupled to processor chassis 16 is a keyboard (not shown) and a monitor 18. Input into computers 12 and 14 may be accomplished by use of the keyboard and/or a mouse (not shown) or other pointing device that controls a cursor that is  
30   in turn used to make selections in programs executed on computers 12 and 14. Optionally, computers 12 and 14 may also include a floppy drive 20, a compact disk drive 22, and an internal hard drive as is known in the art. Computers 12 and 14 preferably also include an internal/external modem as is  
35   known in the art.

To communicate with other computers, the computers of the invention are preferably coupled to a network, such as the Internet 24. However, it will be appreciated that other

types of networks may be employed to operate the invention, including local area networks (LAN), wide area networks (WAN), a corporate intranet/extranet, secured private networks, and the like. Indeed, Internet 24 is depicted as an amorphous shape to suggest that the details of connection with the various computers are continually evolving.

System 10 further includes a merchant server computer 26 which is able to communicate with computers 12 and 14 via Internet 24. Merchant server computer 28 is employed to transfer various information between computer 12 and computers 14 as well as between a credit organization computer 28. The connection between merchant service computer 26 and credit organization computer 28 is preferably provided over a secured network such as a value added network (VAN). Alternatively, computers 26 and 28 may be coupled together using dial-up link open modems and the telephone network or an encrypted connection over the Internet.

Credit organization computer 28 includes a database of various individuals and their credit account status. In this way, computer 28 is able to issue authorizations to charge various payment instruments. Further, computer 28 is able to initiate commands to transfer money from an account to complete a purchase as is known in the art. Although shown with only one credit organization computer 28, it will be appreciated that merchant server computer 28 may be connected to multiple credit organization computers depending on which credit organizations need to be contacted in order to charge a payment instrument. Credit organization computers 28 are typically operated by a bank which has associations with various credit card companies, such as VISA and MasterCard. Alternatively, credit organization computer 28 may be operated directly by a credit card company, such as American Express.

Merchant server computer 26 is preferably an Intel Pentium or Digital alpha-based microprocessor computer, running Microsoft Windows NT. All of the specialized software required to manage the methods of the invention run on merchant server computer 26 as described hereinafter. Software tools that may be employed to implement the methods

of the invention on merchant server computer 28 include Microsoft SiteServer Commerce Edition as the base platform. Various custom components may be built using Microsoft Active Server Pages and Microsoft Visual C++. Links to the various credit payment computers 28 may be supported by software from Veriphone or CyberCash. Further, credit organization computers 28 typically comprise mainframe computers as is known in the art.

The specific hardware and software described in connection with system 10 is merely illustrative of hardware and software that may be employed to implement the methods of the invention. Hence, it will be appreciated that the invention is not limited to the specific types of hardware and software employed to implement the invention.

Referring now to Fig. 2, one exemplary method for facilitating a purchase transaction where one or more contributions are made using one or more payment instruments will be described. For convenience of discussion, reference will be made to a primary buyer, co-payers, and a recipient. The primary buyer is the individual who initiates the purchase, solicits other contributors, and provides final purchase authorization. The co-payers are additional people who contribute toward the purchase price. The recipient is the person who receives the item or items being purchased. It will be appreciated that the recipient may also be the primary buyer or a co-payer. For example, a child may purchase an item for himself and solicit contributions, or the full amounts, from a parent. Accordingly, the primary buyer does not necessarily have to contribute anything to the purchase.

In the method of Fig. 2, three subprocesses are employed. These include steps 30-46, 48-68, and 70-92. In describing the method of Fig. 2, reference will also be made to Fig. 1. The first subprocess is the initial order subprocess. As illustrated in step 30, the process begins when the primary buyer chooses an item to purchase. As shown in step 32, the primary buyer browses and/or searches an online catalog and selects the item to purchase. The online catalog preferably resides on merchant server computer 26 and

is viewed on monitor 18 of primary buyer computer 12 as shown in Fig. 1. In this way, the primary buyer is able to utilize primary buyer computer 12 to select the desired item from an online catalog. Once the item has been selected, it is added  
5 to the primary buyer's order and stored in merchant server computer 26.

As shown in step 34, the primary buyer is given the option of choosing more items that are to be added to the order. If so, the primary buyer simply returns to step 32 and  
10 selects another item. Once all the items to be purchased have been selected, the method proceeds to step 36 where the primary buyer selects one or more co-payers that the primary buyer wishes to contribute to the purchase price of the item or items. The selection of the co-payers may be accomplished  
15 by typing into primary buyer computer 12 the name of a co-payer and an e-mail address, or other identifier that will be recognized by merchant server computer 26. As shown in step 38, the primary buyer is given the option of selecting other co-payers who may wish to contribute toward the purchase  
20 price.

Once all the co-payers are selected, the method proceeds to step 40 where the primary buyer is given the option of entering his or her own personal contribution toward the purchase price. The primary buyer may choose not to  
25 contribute by simply entering a zero amount. If the primary buyer does wish to contribute, the primary buyer enters his or her credit card information into primary buyer computer 12 where it is transferred to merchant server computer 26. The primary buyer is further given the option of composing a  
30 solicitation letter to the co-payers explaining who is to receive the item and why they are being asked to contribute as illustrated in step 42. As shown in step 44, merchant server computer 26 forwards the solicitation letter along with the order itemization to the co-payer computers which correspond  
35 to the co-payers identified by the primary buyer. For example, the primary buyer may enter the e-mail address for each of the proposed contributors. This information is processed by merchant server computer 26 who then sends the

solicitation letter and order itemization to the appropriate co-payer computers. Once this is accomplished, the initial order subprocess is complete as illustrated in step 46.

Steps 48-60 illustrate a co-payer contribution subprocess. This subprocess starts when one of the co-payers reads the solicitation letter as shown in step 50. The solicitation letter preferably includes a hypertext link and/or instructions on how to contribute a payment toward the purchase price of the item. The co-payer simply selects its link or follows the instructions that are provided. As shown in step 52, the co-payer is asked whether they wish to contribute toward the purchase price of the item. If the co-payer wishes to contribute, the process proceeds to step 56. Otherwise, the process proceeds to step 54. If no contribution is to be supplied, the co-payer simply enters a zero amount into co-payer computer 14. If the co-payer does wish to contribute, the amount of the contribution and the credit card information are entered into co-payer computer 14. The co-payer is also given the option to enter comments regarding the contribution, as shown in step 58. If so, the co-payer enters the comment into co-payer computer 14 as illustrated in step 60. Information entered into co-payer computer 14 is transferred to merchant server computer 26 where it is stored. Further, merchant server computer 26 e-mails a notice of the contribution (or lack thereof) and the comments (if any) to primary buyer computer 12 and all other co-payer computers 14 as shown in step 62.

Merchant server computer 26 totals all of the existing contributions and determines whether the sum is more than the order total, preferably including tax, shipping and handling, as shown in step 64. If so, the method proceeds to step 66. Otherwise, the method proceeds to step 68. If the contributions are sufficient, a notice is sent to primary buyer computer 12 indicating that the total contribution is adequate. The co-payer contribution process is then complete.

Steps 70-92 illustrate the order of confirmation subprocess. In this subprocess, the buyer reads the notice that sufficient contributions have been authorized, as shown

in step 72. Optionally, primary buyer computer 12 may be sent information about who is contributing. At this point, the primary buyer has the option as to whether to proceed with the existing contributions or wait for additional contributions

5 (which may reduce the actual amounts that the existing contributors pay) as shown in step 74. As shown in step 76, if the primary buyer declines to accept the order, the primary buyer may simply wait for additional contributions.

Preferably, a notice will be sent to primary buyer computer 12 each time additional contributions are proposed. In this way, the primary buyer may return at any time to confirm the order.

Once the primary buyer confirms the order, merchant server computer 26 sends an authorization request to each relevant credit management computer 28 to see if the banks or credit organizations will authorize the charges as shown in step 78. Merchant server computer 26 receives the responses from credit management computers 28 and analyzes the responses to determine if any of the authorizations have failed as shown in step 80. If one or more of the authorizations have failed, all successful authorizations are preferably cancelled and the contributions that failed are reset as shown in step 82. A notification is also sent to the primary buyer computer 12 as shown in step 84. The failed co-payer is preferably also notified by sending a message from merchant server computer 26 to co-payer computer 14. At this point, the process proceeds to step 86 where the process will restart once the primary buyer receives notice that sufficient contributions again exist.

As shown in step 88, if all authorizations are successful, all of the cards are charged. Once the payment for the item has been accepted, the order is filled, as shown in step 90. The order confirmation sub-process is then complete as shown in step 92. Preferably, once the item has been purchased, it will be delivered via mail or other delivery system to the recipient.

It will be appreciated that the method of Fig. 2 is one exemplary method of purchasing an item. However, various alternatives to this method may be used to facilitate

transaction processes. For example, instead of waiting until sufficient contributions have been proposed before authorizing the credit cards, the credit card of a co-payer may be authorized immediately after the contribution information is entered into the co-payer computer. This is advantageous in that, if a mistake was made while entering the number, such a mistake may be detected and immediately corrected. Further, only the co-payer, i.e., the card holder, will know when the card has failed authorization. In this way, the primary buyer and the other co-payers will not be aware of any credit problems of the other co-payer.

Authorizations for credit cards typically only hold for about 4-7 days. However, the authorizations can be refreshed by merchant server computer 26 to prevent expiration. More specifically, if it takes longer than the amount of time for the other co-payers to make their contribution, merchant server computer 28 will send a request to refresh the authorizations. Because a co-payer will typically not wish to have funds perpetually reserved on their credit card, merchant server computer 28 is preferably configured with an expiration date at which point it will cease sending requests to refresh the authorization.

In one aspect, the ordered item or items may be immediately reserved in inventory when the initial order is placed at primary buyer computer 12. Typically, the warehouse having the items has access to the database in merchant server computer 26 so that it will know when an order has been placed. Hence, once a notification has been received of an order, the warehouse may immediately reserve the item. In this way, there is no need to wait for all co-payers to send in their proposed contributions before securing the order. Merchant server computer 26 is preferably configured so that the reservation will be released after a predetermined amount of time has passed so that the item will not remain perpetually reserved. In the event that the item is not in stock, the warehouse may immediately backorder to replenish the inventory without waiting for the process to complete.

In some cases, the sum of the proposed contributions may exceed the total cost of the item or items. In such a case, merchant server computer 26 may be configured to proportionally charge each co-payer the amount the co-payer contributed relative to the sum of all the contributions. Typically, credit card companies are able to accept settlements that are less than the authorized amount.

In one alternative, the primary buyer is given the option at primary buyer computer 12 to include proposed contribution amounts for each of the selected co-payers. The primary buyer may select to have the proposed contribution amounts generally known to each co-payer or to be private to the individual co-payer.

Another feature of the invention is the ability to accommodate refunds or returns by reversing the charges on the payment instruments used in the original purchase. One exemplary method for accommodating refunds is illustrated in Fig. 3. At step 100 the refunding process begins. This may be a request for a refund and/or the recipient may return the purchased goods as shown in step 102. The request is evaluated as shown in step 104. If the request is not approved, the process ends at step 106. If approved, the process proceeds to step 108 where the multi-instrument payment is split into a set of independent refunds (since multiple payment instruments were used in the original transaction). In this way, each payment instrument that was used in the original transaction may have its charges reversed. This is shown in step 110. If any of the reversals are unsuccessful, the processes is repeated for the unsuccessful attempts. In some cases, it may be impracticable or impossible to issue a reversal, e.g. the payor has closed his or her credit-card account. In such a case, a refund check may be issued and mailed to the payor. After all reversals have been accomplished, the process ends at step 112.

The process of Fig. 3 takes advantage of the unlikelihood that the reversals will fail due to a lack of credit on the part of the vendor. As such, it is not



necessary to synchronize the refunds as is the case with the original purchase. Instead, it is only necessary to ensure that all refunds eventually occur.

5 In another option, the contribution amounts may be kept confidential, so that only the contributors know how much was authorized. Further, the names of the contributors and/or the primary buyer might be kept confidential.

10 In the case of charitable situations, system 10 may be configured to offer an option for an open solicitation for contributions with the names and amounts of the contributions being kept confidential. In this manner, anyone may choose to contribute without being named by the primary buyer.

15 In another alternative, the item to be purchased may be a gift certificate or cash. The gift of cash is particularly useful when utilizing the confidential contribution option as described above. In this way, a system is provided to easily and conveniently collect contributions for a charitable cause.

20 When the item to be purchased is a gift certificate or cash, the purchase may be settled on a particular date regardless of the total amount of the contributions. The gift certificate or cash amount would simply be the total of contributions on the ending date. Alternatively, the transaction may be kept open with regular, 25 periodic statements as a way to continuously collect funds for a particular purpose.

30 When the item being purchased is cash, the cash amount may be less than the total of all the contributions. This may happen, for example, when a credit card company charges a small percentage of the transaction.

In another alternative, the total amount required or contributed may be hidden from both the co-payers and the primary buyer. This may be particularly useful when there is a confidential set of co-payers.

35 In still another alternative, the primary buyer may shop for items from primary buyer computer 12 before identifying that any co-payers will be used. In this manner, the primary buyer is able to assemble an order and then select

the option of asking co-payers to contribute at the time of payment. Preferably, each time an item is selected it is added to a shopping cart as is known in the art. See, for example, U.S. Patent No. 5,715, 314, the complete disclosure of which is herein incorporated by reference, and web sites, such as [www.gap.com](http://www.gap.com) and [www.nordstrom.com](http://www.nordstrom.com).

The hosting organization of merchant server computer 26, e.g., the organization responsible for providing and shipping the items, may offer members a credit account with an established billing/payment system. In this way, the primary buyer or co-payer who is a member of the organization hosting the site need not enter any payment instrument information. Rather, the members may be directly billed and the process may proceed with only the entry of the contribution amount.

In another option, merchant server computer 26 may store the credit card information in its database so that, on subsequent visits, the user may simply choose to use the card instead of re-entering the credit card information.

As previously described, the methods may be employed to order one or more items. In the case where only a single item is to be purchased, merchant server computer 26 may be configured to display an "instant purchase" button on monitor 18 of primary buyer computer 12. In this manner, the shopping cart process is bypassed and allows the primary buyer to immediately begin selecting the co-payers.

As previously described, a variety of payment instruments may be employed with the methods of the invention. Hence, the invention is not limited to the use of credit card payments. Indeed, other payment mechanisms may be used where it is possible to separate the authorization step from the settlement step. As one example, a check may be used for payment. In such a case, merchant server computer 28 is able to communicate with a bank to determine if sufficient funds are in the payor's account before processing the check.

However, due to the nature of checks, the check may only be used for the stated amount and not a reduced amount as with a credit card. In the event that the co-payers contribute in excess of the purchase price, refund checks may be issued to

the co-payers. Alternatively, a gift certificate for the excess amount may be enclosed with the purchased item.

The invention may also be utilized to allow contributors to purchase gift certificates. In such a method, each of the co-payers purchases a gift certificate using their co-payer computer. This information is then transferred to the primary buyer via primary buyer computer 12. Such gift certificates are "virtual" certificates that take the form of credit in the primary buyer's account as saved on merchant server computer 26 rather than physical certificates. Once the primary buyer has received sufficient certificates (credit), the primary buyer proceeds to make the purchase using the certificates for payment.

Another alternative method is a purchase authorization method. According to this method, the co-payers authorize the primary buyer to use their payment instrument to purchase a particular item (or set of items) up to a certain maximum contribution. Once the primary buyer receives sufficient contributions, the primary buyer proceeds with the purchase.

In still another option, contributions may be collected for items other than those listed by the merchant server computer. With this option, the contributions are collected and saved in a "purchasing account" which may be drawn on by the buyer. In this way, essentially any type of item may be purchased, regardless of whether it is offered by the vendor operating the merchant server computer.

For example, the primary buyer simply need to transmit to the merchant server computer the name of an item that is to be purchased along with an appropriate description and cost. Requests for contributions are solicited in a manner similar to that previously described. Once sufficient funds have been collected as previously described, the funds are stored in a "purchasing account". The primary buyer has access to the funds in this account and can withdraw the funds to purchase the item. For example, a credit card, debit card, negotiable instrument, or other transaction instrument may be issued to the primary buyer who may use the transaction

instrument to apply the funds in the purchasing account towards the transaction.

The invention has now been described in detail for purposes of clarity of understanding. However, it will be appreciated that certain changes and modifications may be made. Therefore, the scope and content of the invention should be determined in light of the claims set forth below as well to the full range of equivalents to which those claims are entitled.

WHAT IS CLAIMED IS:

1           1. A method for facilitating a purchase  
2 transaction, comprising:

3           selecting from a primary buyer computer an item that  
4 is desired to be purchased by payment of a purchase price;  
5           collecting at least one proposed contribution toward  
6 the purchase price from at least one co-payer computer; and  
7           accepting an amount of the proposed contribution  
8 sufficient to meet the purchase price.

1           2. A method as in claim 1, further comprising  
2 entering a contribution toward the purchase price from the  
3 primary buyer computer.

1           3. A method as in claim 1, further comprising  
2 identifying at the primary buyer computer at least one co-  
3 payer from which proposed contributions are to be collected.

1           4. A method as in claim 3, further comprising  
2 composing a solicitation letter at the primary buyer computer  
3 which contains a request for a contribution toward the  
4 purchase price and sending the letter to the co-payer  
5 computer.

1           5. A method as in claim 1, further comprising  
2 selecting the item from an inventory of items displayed at the  
3 primary buyer computer.

1           6. A method as in claim 1, further comprising  
2 sending a notification to the primary buyer computer of any  
3 proposed contributions.

1           7. A method as in claim 1, further comprising  
2 sending a notification to the primary buyer computer when the  
3 contribution meets or exceeds the purchase price.

1           8. A method as in claim 7, further comprising  
2 confirming the selection from the primary buyer computer after  
3 receiving the notification.

1           9. A method as in claim 8, wherein the proposed  
2 contribution is in the form of a credit purchase using a  
3 payment instrument, and further comprising authorizing  
4 charging of the payment instrument prior to accepting the  
5 amount.

1           10. A method as in claim 9, further comprising  
2 collecting multiple proposed contributions using multiple  
3 payment instruments, and wherein the amount is accepted by  
4 charging the payment instruments only after authorizations to  
5 charge all of the payment instruments have been received.

1           11. A method as in claim 1, further comprising  
2 delivering the ordered item to a recipient.

1           12. A method for facilitating a purchase  
2 transaction, comprising:  
3           selecting from a primary buyer computer which is  
4 coupled to a network an item that is desired to be purchased  
5 by payment of a purchase price;  
6           sending the selection of the item to one or more co-  
7 payer computers over the network along with a request to  
8 contribute toward the purchase price;  
9           collecting proposed contributions toward the  
10 purchase price from the co-payer computers; and  
11           accepting an amount of the proposed contributions  
12 sufficient to meet the purchase price.

1           13. A method as in claim 12, further comprising  
2 collecting a contribution toward the purchase price from the  
3 primary buyer computer.

1           14. A method as in claim 12, further comprising  
2 identifying at the primary buyer computer co-payers who may  
3 wish to contribute to the purchase price.

1           15. A method as in claim 14, further comprising  
2 composing a solicitation letter at the primary buyer computer  
3 which contains a request for a contribution toward the  
4 purchase price and sending the letter over the network to the  
5 co-payer computers.

1           16. A method as in claim 12, further comprising  
2 sending over the network a notification to the primary buyer  
3 computer of any proposed contributions.

1           17. A method as in claim 12, further comprising  
2 sending over the network a notification to the primary buyer  
3 computer when the contributions meet or exceed the purchase  
4 price.

1           18. A method as in claim 17, further comprising  
2 confirming the selection from the primary buyer computer after  
3 receiving the notification.

1           19. A method as in claim 18, wherein the proposed  
2 contributions are in the form of a credit purchase using  
3 multiple different payment instruments, and further comprising  
4 sending authorization requests to banks or credit  
5 organizations who have authority to charge the payment  
6 instruments prior to accepting the amount.

1           20. A method as in claim 19, wherein the amount is  
2 accepted by charging the payment instruments only after  
3 authorizations to charge all of the payment instruments have  
4 been received.

1           21. A method as in claim 12, further comprising  
2 delivering the item to a recipient.

1           22. A system for facilitating a purchase  
2 transaction, comprising:

3           at least one network server computer which is  
4 adapted to be coupled to a network to allow the network server  
5 computer to communicate with a primary buyer computer and at  
6 least one co-payer computer;

7           code to present a list of inventory items at the  
8 primary buyer computer to allow the primary buyer computer to  
9 select one of the items to purchase at a given purchase price;

10          code to send a message to the co-payer computer  
11 requesting whether a contribution is to be made toward the  
12 purchase price of the item using a payment instrument;

13          code to determine when one or more proposed  
14 contributions toward the purchase price meets or exceeds the  
15 purchase price; and

16          code to send a command to charge the payment  
17 instrument(s) to pay the purchase price.

1           23. A system as in claim 22, further comprising  
2 code to send over the network a notification to the primary  
3 buyer computer of any proposed contributions.

1           24. A system as in claim 22, further comprising  
2 code to send over the network a notification to the primary  
3 buyer computer when the proposed contributions meet or exceed  
4 the purchase price.

1           25. A system as in claim 24, further comprising  
2 code to send a confirmation of the selection from the primary  
3 buyer computer to the network server computer after receiving  
4 the notification to confirm that the item is to be purchased.

1           26. A system as in claim 25, wherein the network  
2 server computer is also adapted to be coupled to at least one  
3 credit organization, wherein at least one of the proposed  
4 contributions involves a credit transaction, and further  
5 comprising code to contact the credit organization to  
6 authorize the charging of the payment instrument(s).



1           27. A system as in claim 26, wherein the network  
2 server computer receives proposed contributions from multiple  
3 different payment instruments, and further comprising code to  
4 send the command to charge the payment instruments only after  
5 receiving authorization from the credit organization to charge  
6 all of the payment instruments.

1           28. A method for facilitating a purchase  
2 transaction, comprising:

3           at a merchant server computer, collecting multiple  
4 proposed contributions toward a purchase price of an item  
5 using multiple payment instruments;

6           sending from the merchant server computer requests  
7 for authorization to charge the payment instruments;

8           at the merchant server computer, collecting returned  
9 responses to the authorization requests;

10          sending from the merchant server computer commands  
11 to charge all of the payment instruments only if the responses  
12 indicate an authorization to charge all of the payment  
13 instruments.

1           29. A method as in claim 28, wherein the payment  
2 instruments are selected from the group consisting of credit  
3 cards from different credit organizations, debit cards, smart  
4 cards, utility bills, credit accounts, billing services,  
5 electronic funds transfer, bank accounts, brokerage accounts,  
6 and money market funds.

1           30. A method as in claim 28, further comprising  
2 sending the proposed contributions to the merchant server  
3 computer from multiple co-payer computers which are coupled to  
4 the merchant server computer over a network.

1           31. A method as in claim 30, further comprising  
2 sending a list of proposed contributors to the merchant server  
3 computer from a primary buyer computer which is coupled to the  
4 network, and sending requests for proposed contributions to  
5 the co-payer computers over the network.

1           32. A method as in claim 28, further comprising  
2 sending the authorization requests to banks or credit  
3 organizations who have authority to charge the payment  
4 instruments.

1           33. A method for facilitating a purchase  
2 transaction over a network of computers, the method  
3 comprising:  
4           receiving a selection of an item that is desired to  
5 be purchased by payment of a purchase price from a primary  
6 buyer computer;  
7           collecting at least one proposed contribution toward  
8 the purchase price from at least one co-payer computer; and  
9           accepting an amount of the proposed contribution  
10 sufficient to meet the purchase price.

1           34. A method as in claim 33, further comprising  
2 collecting multiple contributions from multiple co-payer  
3 computers, wherein the proposed contributions are in the form  
4 of a credit purchase using multiple different payment  
5 instruments, and further comprising sending authorization  
6 requests to banks or credit organizations who have authority  
7 to charge the payment instruments prior to accepting the  
8 amount.

1           35. A computer readable medium containing a program  
2 for transacting a sale over a network of computers comprising  
3 the steps of:  
4           receiving a selection of an item that is desired to  
5 be purchased by payment of a purchase price from a primary  
6 buyer computer;  
7           collecting at least one proposed contribution toward  
8 the purchase price from at least one co-payer computer; and  
9           accepting an amount of the proposed contribution  
10 sufficient to meet the purchase price.

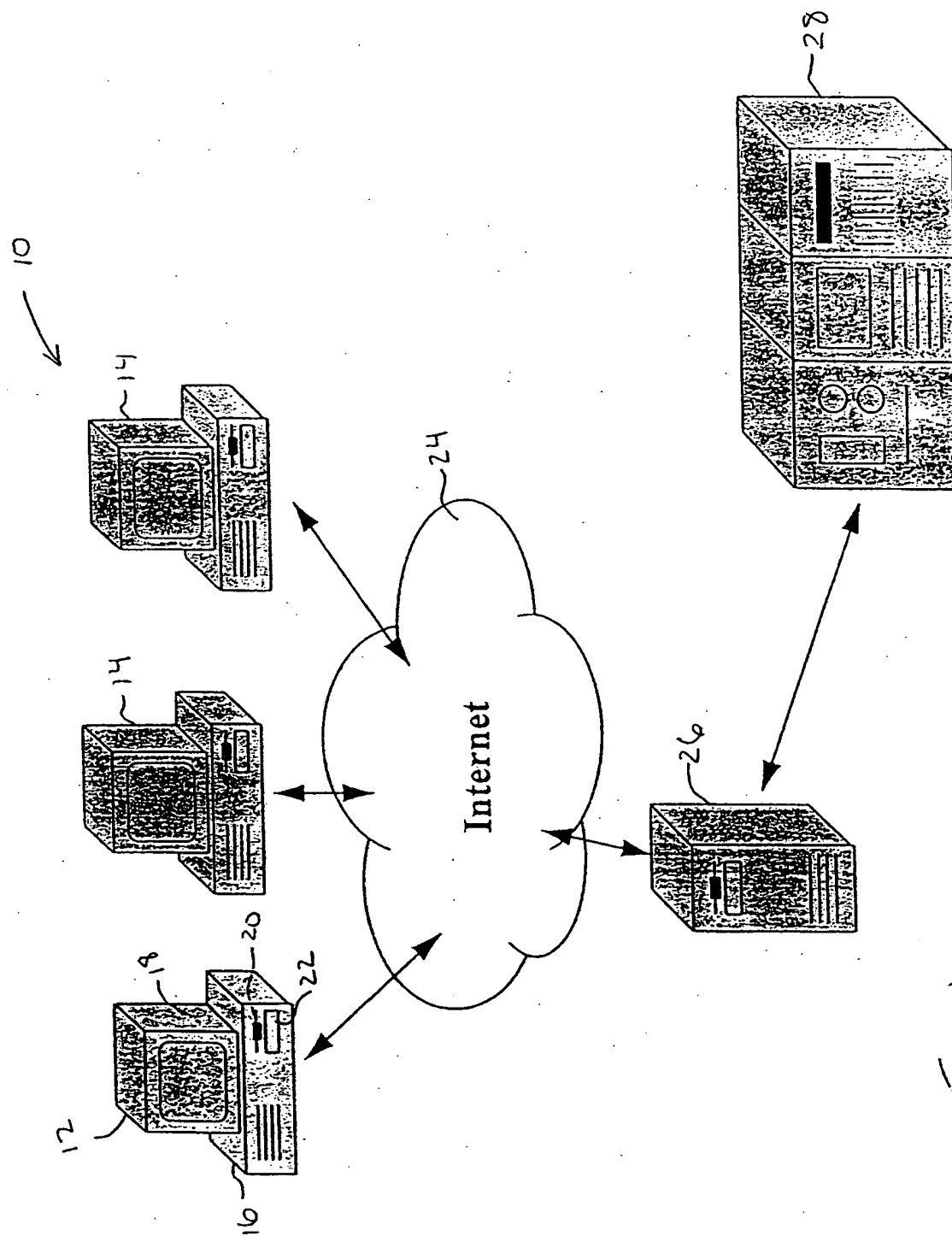
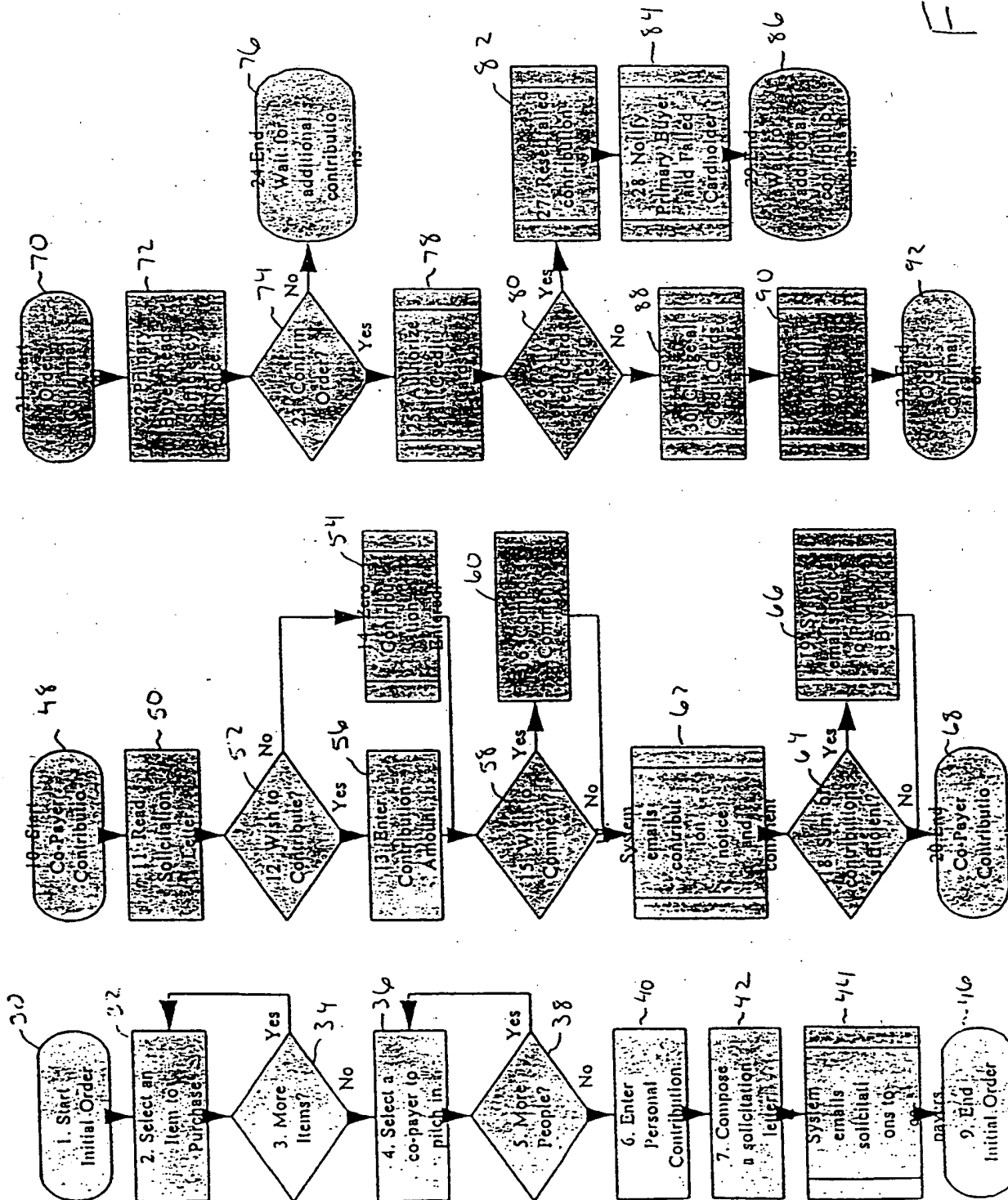
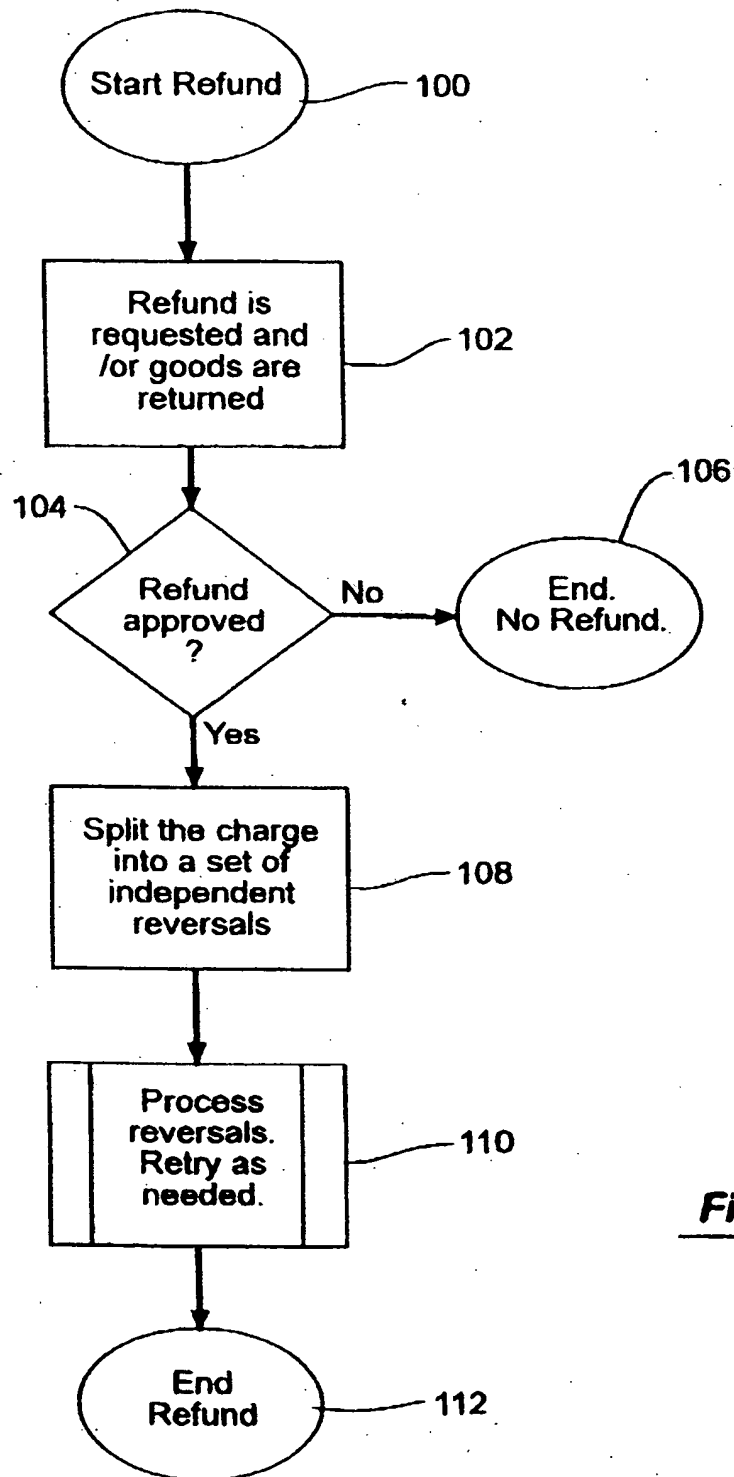


FIG. 1

FIG. 2



**Fig. 3**

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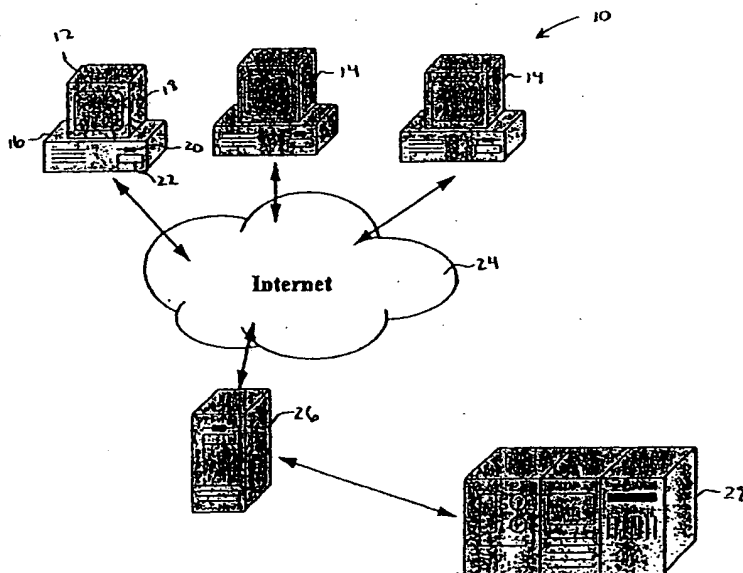
(43) International Publication Date  
14 September 2000 (14.09.2000)

PCT

(10) International Publication Number  
WO 00/54122 A3

- (51) International Patent Classification<sup>7</sup>: G06F 17/60 (81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (21) International Application Number: PCT/US00/03526
- (22) International Filing Date: 10 February 2000 (10.02.2000)
- (25) Filing Language: English
- (26) Publication Language: English (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- (30) Priority Data:  
09/265,147 9 March 1999 (09.03.1999) US
- (71) Applicant: ANCESTRY.COM, INC. [US/US]; 266 West Center Street, Orem, UT 84057 (US).
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- (74) Agents: GIBBY, Darin, J. et al.; Townsend and Townsend and Crew LLP, 8th floor, Two Embarcadero Center, San Francisco, CA 94111 (US).
- Published:  
— With international search report.
- (88) Date of publication of the international search report:  
5 April 2001
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHODS FOR SHARED ELECTRONIC PURCHASING



(57) Abstract: Systems and methods are provided for facilitating a purchase transaction. According to one method (see Fig. 1), multiple proposed contributions towards a purchase price of an item using multiple payment instruments are collected at a merchant server computer (26). The merchant server computer sends requests for authorization to charge the payment instruments. The merchant server computer collects the returned responses to the authorization requests. The merchant server computer then sends commands to charge all of the payment instruments only if the responses indicate an authorization to charge all of the payment instruments.

WO 00/54122 A3

## INTERNATIONAL SEARCH REPORT

 International application No.  
 PCT/US00/03526

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/60

US CL : 705/26

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,794,219 A (BROWN) 11 August 1998, Abstract; col. 3, lines 45-67; col. 4, lines 1-22; col. 4, lines 51-61; col. 6, lines 17-51; col. 7, lines 6-59; col. 8, lines 20-59	1-35
Y,P	US 6,023,686 A (BROWN) 08 February 2000, Abstract	1-35
Y	US 5,826,244 A (HUBERMAN) 20 October 1998, Abstract	1-35
Y,E	US 6,101,484 A (HALBERT et al.) 08 August 2000, Abstract	1-35



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

30 NOVEMBER 2000

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02 JAN 2001

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/03526

## B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

DIALOG, STN

search terms: network, Internet, buyer, seller, computer, server, contribution, price, co-payer, inventory, solicit, item  
or purchase of good, primary buyer, credit, purchase or buy, payment





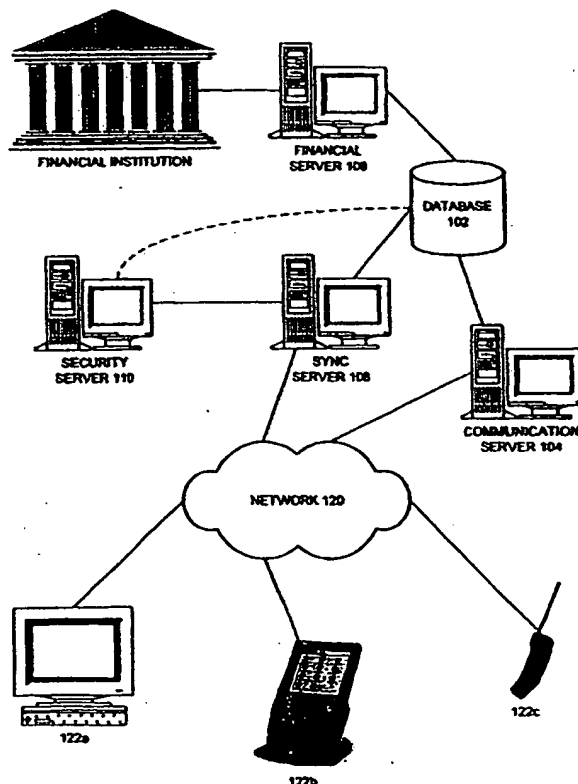
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>G06F 17/60</b>		A2	(11) International Publication Number: <b>WO 00/67177</b>
			(43) International Publication Date: 9 November 2000 (09.11.00)
(21) International Application Number: <b>PCT/US00/11732</b>		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: <b>28 April 2000 (28.04.00)</b>			
(30) Priority Data: 60/131,785 30 April 1999 (30.04.99) US 60/144,633 19 July 1999 (19.07.99) US 60/172,311 17 December 1999 (17.12.99) US			
(71) Applicant: X.COM CORPORATION [US/US]; 394 University Avenue, Palo Alto, CA 94301 (US).			
(72) Inventors: LEVCHIN, Max; 469 Grant Avenue #Q, Palo Alto, CA 94306 (US). NOSEK, Luke; 469 Grant Avenue #P, Palo Alto, CA 94306 (US). THIEL, Peter; 1788 Oak Creek Drive #416, Palo Alto, CA 94304 (US). BANISTER, Scott, Alan; 1480 Bay Laurel Drive, Menlo Park, CA 94025 (US).			
(74) Agents: VAUGHAN, Daniel, E.; Park & Vaughan LLP, 702 Marshall Street, Suite 310, Redwood City, CA 94063 (US) et al.		Published Without international search report and to be republished upon receipt of that report.	

(54) Title: SYSTEM AND METHOD FOR ELECTRONICALLY EXCHANGING VALUE AMONG DISTRIBUTED USERS

## (57) Abstract

A system and method are provided for facilitating a value exchange transaction involving multiple parties. The system may comprise a synchronization server for exchanging transaction details with client devices, a communication server for registering new users, a financial server for interacting with external financial institutions, and a security server for ensuring the security of value exchange transactions. In one method, a first party initiates a transaction on a client (e.g., a mobile computing device) by selecting or inputting an identifier (which may be pre-existing, such as a telephone number) of another party and a value to be exchanged. The transaction may be conducted while the parties' client devices are electronically connected or may be conducted by one user on one device. Transactions are communicated to a system server during a synchronization between a party's client device and a system server. When the transaction is submitted to the system, if the second party is not a registered user of the system he or she is invited to register and complete the transaction.



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# **SYSTEM AND METHOD FOR ELECTRONICALLY EXCHANGING VALUE AMONG DISTRIBUTED USERS**

5

## **BACKGROUND**

This invention relates to the fields of computer systems and communications. More particularly, a system and methods are provided for facilitating the exchange of value among distributed users through computing devices.

Existing methods of transferring or exchanging values among multiple persons have many shortcomings. For example, the use of cash requires regular replenishment, creates the need to make change, allows the possibility of theft or loss and has no built-in or easy method of keeping records concerning cash payments and receipts. Similarly, checks can be forged, they often provide only rudimentary record keeping (e.g., check stubs) and allow one to unwittingly overdraw a checking account. Credit cards may mitigate some of the problems with cash and checks, but cannot be used for making payments or exchanging value between two or more individuals.

In addition, the formalities of existing value exchange transactions can make them inefficient or difficult to complete. For example, transferring money to another person's bank or other financial account may require one to know the person's account number. That person may understandably be reluctant to divulge such information.

Thus, what is needed is a system and method for enabling value transfers without all the shortcomings of existing means and techniques. It would be desirable, for example, to allow a value exchange transaction to be conducted using a known or common identifier of a person (e.g., electronic mail address, telephone number) rather than other, more sensitive, information.

## **SUMMARY**

In one embodiment of the invention a system and methods are provided for conducting a value exchange between two or more persons using a distributed value exchange system.

In this embodiment the system may comprise one or more system servers configured to register a person or other entity (e.g., a business) as a system user and allow him or her to conduct value exchange transactions with persons who may or may not also be registered users. A user then employs a client computing device (e.g., a handheld, 5 palmtop or desktop computer, a web-enabled telephone, a two-way pager) to initiate or conduct a value transfer. The value exchange may be conducted while online with (e.g., connected to) the system, while offline, while connected (e.g., via wireless connection) to another user's device, etc. When the transaction is submitted to the system, it notifies transaction parties that are as-yet unaware of the transaction and attempts to clear or 10 finalize the transaction and adjust the users' account balances appropriately.

A communication server may be configured to receive connections (e.g., wired and/or wireless) from persons wishing to become registered users. A synchronization server may be configured to facilitate the synchronization of user's client devices with the system. During synchronization, users' devices may submit transactions to the system, 15 receive information on new or cleared transactions, synchronize account information on the system with the information on the client device, etc. A security server may be configured to enforce security procedures, possibly using asymmetric and/or symmetric cryptographic techniques. A financial server interacts with other system servers and external financial institutions to enable a user to inject value into the system and withdraw value from the 20 system. One or more databases may store account information for users (e.g., account information, transaction details) and help coordinate system activity.

In one method of conducting a value exchange a person registers with the system, an account is created for him and system software is downloaded to his client device. The user may then conduct transactions on his client whether he is connected to the system or 25 not. When not connected, the client stores transaction details and, when later connected to the system for synchronization purposes, uploads his transactions to the system and may receive transactions initiated by other users. Each transaction may include an identifier of another party to the transaction and the value to be exchanged. In one embodiment of the invention transaction parties may be identified by identifiers that have meaning outside the 30 system, such as electronic mail addresses, telephone number, social security numbers, etc. Thus, the user may initiate a transaction with a person who is not a registered user as long as he knows an appropriate identifier of the person.

When the system receives a new transaction initiated by a user it attempts to contact the other party or parties using the identifier(s) provided by the initiating user. If another party is a registered user, the system may also know other methods of contacting the party. For a party who is not already a user, he or she is invited to connect to the system, register and complete the transaction.

Virtually any means of value transfer may be associated with the system. Users may introduce value into their system accounts via credit card, check, cash, electronic funds transfer, direct deposit, etc. Value may be withdrawn from the system using the same or similar processes. The value that is exchanged between transaction parties may be monetary (e.g., represented by United States dollars or other currency) or have some other form, such as credits, affinity points, frequent flier miles, vouchers, barter points, etc.

### DESCRIPTION OF THE FIGURES

FIG. 1 is a block diagram depicting a system for conducting value exchange transactions in accordance with an embodiment of the present invention.

FIG. 2 is a flowchart illustrating one method of conducting a value exchange transaction in accordance with an embodiment of the invention.

FIG. 3 depicts one form of an indirect value exchange transaction from a first user to a second user performed on the first user's mobile client device in accordance with an embodiment of the invention.

FIG. 4 depicts one form of a direct value exchange from a first user to a second user conducted with the user's mobile client devices in accordance with an embodiment of the invention.

### DETAILED DESCRIPTION

The following description is presented to enable any person skilled in the art to make and use the invention, and is provided in the context of particular applications of the invention and their requirements. Various modifications to the disclosed embodiments will be readily apparent to those skilled in the art and the general principles defined herein may be applied to other embodiments and applications without departing from the spirit and scope of the present invention. Thus, the present invention is not intended to be limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features disclosed herein.

The program environment in which a present embodiment of the invention is executed illustratively incorporates a general-purpose computer or a special purpose device such as a hand-held computer. Details of such devices (e.g., processor, memory, data storage, display, wired/wireless communication capability) are omitted for the sake of  
5 clarity.

It should also be understood that the techniques of the present invention might be implemented using a variety of technologies. For example, the methods described herein may be implemented in software executing on a computer system, or implemented in hardware utilizing either a combination of microprocessors or other specially designed  
10 application specific integrated circuits, programmable logic devices, or various combinations thereof. In particular, the methods described herein may be implemented by a series of computer-executable instructions residing on a storage medium such as a carrier wave, disk drive, or computer-readable medium. Exemplary forms of carrier waves may take the form of electrical, electromagnetic or optical signals conveying digital data streams  
15 along a local network or a publicly accessible network such as the Internet.

### **Introduction**

In one embodiment of the invention a system and method are provided for facilitating an exchange of value between two or more persons using client computing  
20 devices. Values that are exchanged may be monetary in nature (using any currency) or may take other forms, such as credits, debits, discounts, vouchers, certificates, mileage (e.g., frequent flier miles), etc. The computing devices used to conduct an exchange transaction may or may not be portable in nature, and may employ virtually any communication media, including both wired and wireless. In one implementation of this embodiment, at least one  
25 user employs a portable computing device such as a handheld or palmtop computer, a smart telephone, a two-way pager, etc. A computing device suitable for this embodiment may always be linked to or in communication with another device (e.g., a system server), such as a networked personal computer, or may be disconnectable, such as a hand-held personal digital assistant (PDA). Thus, a value exchange transaction may be conducted offline or  
30 online, while connected or disconnected from other system components.

A system according to this embodiment of the invention includes at least one highly accessible computer server configured to facilitate value exchanges. Illustratively, a user who wishes to initiate a value exchange or value transfer with another party is registered

with the server beforehand (e.g., an account is established for the user on the server). The other party may or may not be a registered user at the time the transaction is initiated or communicated to the system.

5 In one method of conducting a value exchange according to this embodiment of the invention an entity involved in the exchange may be known by an identifier that has meaning or use outside of the system, such as an electronic mail address, a telephone number, a social security number, etc. Illustratively, each such identifier is only associated with one person or entity, thus promoting accountability. In an alternative method, however, multiple users or accounts may be associated with an identifier.

10 In one implementation of a method of conducting a value exchange a registered user of the system initiates an exchange with an unregistered party by identifying that party to the system server by his or her electronic mail address. The registered user may provide various details of the value exchange, such as the form of the value (e.g., a monetary amount, a number of credits or affinity points), a date on which to effect the transfer, the  
15 unregistered party's name, etc. The system may then attempt to contact the unregistered party (e.g., via the provided electronic mail address), notify him or her of the value exchange, identify the initiating user and invite the unregistered party to connect to the server and close the exchange. The unregistered party may be required to register with the system in order to close the transaction. For example, if the value exchange is to the  
20 benefit of the unregistered user, he or she may wish to leave the value in the system in order to use it to conduct an exchange with yet another party. Alternatively, the unregistered party may be permitted to provide just enough information (e.g., credit card number, address) to allow the system to close the transaction, without being registered.

In different embodiments of the invention the value exchange may be initiated by  
25 the person who owes or is owed the value to be exchanged. Further, the value that is exchanged may be of virtually any form and/or may be transformed in nature. For example, a monetary amount or a credit or voucher held by a first user and accepted by a second user may be transferred from the first user to the second user in exchange for goods or services. Or, the value may change from one currency to another or from being monetary in nature to  
30 being represented by credits with a merchant, frequent flier miles, or some other value. Thus, a user may pay for goods or services with value in many different forms, including currency or points that are used only within the system (e.g., for transactions between users).

The system may also be configured to allow users to perform normal banking operations (e.g., withdrawals, deposits, transfers), stock transactions, electronic ticketing, etc. In another embodiment of the invention a third party may be involved to hold the value in escrow until a transaction is closed.

5           Value may be introduced into the system (and credited to a user's account) via cash, check, debit, or virtually any other method that is presently used or that becomes accepted in the business community. Value may exit the system in these and similar forms.

          In alternative embodiments of the invention a distributed system described herein may be used for forms of communication other than value exchanges. For example, in one  
10       alternative embodiment the system may be used to spread or disperse software among multiple users. Illustratively, a registered system user could then provide an unregistered person with the system software and thereby allow them to conduct a transaction. Advantageously, the software could be transmitted between users' client devices using wired or wireless communications.

15

#### **One Embodiment of a System for Facilitating a Value Transfer**

FIG. 1 depicts an illustrative system for facilitating value transfers according to one embodiment of the invention. Alternative embodiments of the invention may incorporate any subset of the components of the illustrated system.

20           The system of FIG. 1 includes central database 102, which is configured to store various information used to facilitate value exchange transactions. Illustratively, the information stored in database 102 includes accounts for registered users of the system as well as various information pertaining to unregistered users participating in or invited to participate in a transaction. User information for registered and/or unregistered users may  
25       include user identifiers (e.g., name, electronic mail address, telephone number, network address, physical address), transaction records, account balances in one or more different forms (e.g., money, frequent flier miles, store credits, affinity points, vouchers, coupons, discounts), preferred communication methods (e.g., electronic mail, wireless voice), security data, etc.

30           In the system of FIG. 1, database 102 is accessed by communication server 104, synchronization server 106, financial server 108 and possibly security server 110. In this embodiment, communication server 104 and/or other system servers are configured to interact with one or more users through communication network 120. For example,



communication server 104 may be or may include a web server, telephone switch, DSLAM (Digital Subscriber Line Access Multiplexer), etc.

A network presence, such as a web site on the Internet, that is hosted by communication server 104 may serve as a primary access point to the system for new and, possibly, existing users. Illustratively, users are given account names and passwords with which to access the system after being registered. Other forms of security (e.g., digital certificates, biometric devices) may be employed in other embodiments of the invention.

In one embodiment of the invention a user may download software for his or her computing device from communication server 104. In particular, communication server 104 may allow a person to register with the system, access and/or modify account information, conduct and clear transactions, etc. A user may be required, however, to register with the system before being able to initiate or close a transaction.

Synchronization server 106 in the illustrated embodiment is configured to synchronize information stored on the system with users' client computing devices and locally stored data. Illustratively, a user may connect to the synchronization server to upload and/or download details of transactions (e.g., value exchanges) that involve the user. During a synchronization session, a user's client may receive updated account information (e.g., reflecting cleared transactions), may authorize the system to charge additional funds to the user (e.g., by charging a credit card or transferring funds from a bank account), access customer service, query the status of a transaction, initiate a new transaction, etc.

Financial server 108 is configured to interface with one or more financial institutions, which may, in one embodiment of the invention, be external to the system. Thus, the financial server may interact with credit card companies, banks (including traditional and online banks) and other entities that handle or process value in suitable forms; in particular, the financial server may be configured to transfer funds through the ACH (Automated Clearing House). Financial server 108 may be configured to automatically generate a charge or credit to a user's account with an external financial institution when the user's system account balance falls below or rises above a predetermined threshold. Further, the external value that the system can access for a user through financial server 108 may affect the number of transactions that the user can conduct or the amount of value in a transaction.

Security server 110 may cooperate with one or more of database 102, communication server 104, synchronization server 106 and financial server 108 to apply,

ensure or enforce security for value exchanges and actions related to value exchanges. In one embodiment of the invention digital signatures may play a large part of the security scheme. DSA (Digital Signature Algorithm), a variant thereof (e.g., ECDSA or Elliptical Curve DSA), RSA or other digital signature protocol may be used. Symmetric  
5 cryptographic schemes such as DES (Digital Encryption Standard) may also be applied in the same or different embodiments. Message authentication codes may be used to verify the integrity and authenticity of messages exchanged between the system and a user.

In a present embodiment of the invention public key encryption techniques may be used with digital certificates to create cryptographically verifiable transactions and prevent  
10 their repudiation. Symmetric encryption schemes may be employed for secure storage of data (e.g., on users' client devices and/or on the system).

Illustratively the organization operating the value exchange system may act as a Certificate Authority and certify individual users, while certified users may, in turn, certify individual transactions. Certified users may be issued identity certificates for use in value  
15 exchange transactions.

An identity certificate may include information such as the user's name, electronic mail address (or other meaningful identifier that identifies the user, such as a telephone number or social security number), account number or name, etc. Illustratively, an identity certificate also includes a public key of the user, which may be used to verify the  
20 authenticity of transactions conducted by the user.

Individual users generate transaction certificates for transactions they conduct or initiate and the system authenticates them with the users' public keys (e.g., during synchronization). A transaction certificate may include the value being exchanged, an identifier of another party to the transaction, other details (if necessary or desired), and may  
25 be signed with the user's private key. In one embodiment, a user's client computing device generates the public/key pair during user registration, and the private key is retained only on the client device.

The illustrated system may communicate with users through various types of communication media. Communication network 120 may thus comprise a traditional wired  
30 network (e.g., the Internet) and/or a wireless network usable by portable devices such as portable computers (e.g., palmtop or handheld), smart (e.g., web-enabled) telephones, two-way pagers, etc. Therefore, users may interact with the system by operating devices such as client computer 122a, portable client computer or digital assistant 122b, wireless telephone

122c and/or other devices capable of communicating with communication server 104 and/or synchronization server 106. Illustratively, portable client computer 122b may be configured to conduct value exchanges with, or communicate them to, the system independently and autonomously. Or, in an alternative embodiment, portable client  
5 computer 122b may be operated to record details of an exchange in a disconnected mode and then, when connected (e.g., docked) with another computing device (e.g., computer 122a) to forward those details to the system in order to finalize the exchange, and/or synchronize with the system.

A portable client device employed by a user to participate in a value exchange  
10 transaction may incorporate a series of instructions for interacting with the system. For example, in one embodiment of the invention a user's client device includes a wallet application that allows the user to access his or her account balance(s) while connected to the system and/or while disconnected from the system. Illustratively, in this embodiment of the invention a user's device periodically connects to synchronization server 106.  
15 During such a connection the user's device communicates with the server to send and receive new transaction information (e.g., details of new value exchanges involving the user) and/or receive updated account information (e.g., to reflect closed transactions). The user may also authorize or perform other activities involving his or her account, such as transfer value to or from a system or institution external to the value exchange system.

20

#### **One Method of Conducting a Value Exchange**

In one embodiment of the invention a value exchange transaction may be conducted by a single user (e.g., with his client device), while connected to or disconnected from a system server (e.g., communication server 104, synchronization server 106 of FIG. 1) or  
25 another party's client. In particular, in one embodiment of the invention a user initiates a transaction by submitting it to the system, which then takes action to close the transaction by notifying another participant, and possibly registering the other participant with the system. In an alternative embodiment, however, a transaction may be conducted in a direct communication between two (or more) parties, after which details of the transaction are  
30 submitted to one of the system servers. In this alternative embodiment, at least one of the parties (e.g., from whom value is being transferred) may be required to be registered with the system.

Illustratively, a transaction cannot be closed or finalized until the system learns of the transaction from one of the involved parties, identifies the other participant(s) and determines how to transfer the value. Closure of a transaction may include the actual transfer of value from one party (e.g., in a first account and/or form) to a second party (e.g.,  
5 to another account and/or form). Parties to a transaction may need to be registered with the system and/or provide certain information (e.g., to identify a party, verify a party's identity, determining how to transfer value to or from the party) before the transaction can be closed.

In this section, one or more methods are described for using a value exchange system such as that depicted in FIG. 1 to effect a value exchange between two or more  
10 parties. The methods and operations described here may be altered or modified for different types of computing devices that a party may employ and/or different system or transaction configurations without exceeding the scope of the invention.

In one embodiment of the invention the system of FIG. 1 may be envisioned as a system for facilitating or conducting a financial transaction involving two or more persons.  
15 Illustratively, at least one person in the transaction is already registered (e.g., has an account) with the system so that at least one form or conduit for transferring value exists. Advantageously, however, a registered user may initiate a transaction with an unregistered party, who may be identified to the system with an existing identifier such as an electronic mail address, telephone number, IP (Internet Protocol) address, etc. Thus, in this  
20 embodiment identifiers associated with unregistered users (and/or registered users) may already have significance or use outside of the system and there may thus be some degree of assurance that they can be reached through or with those identifiers.

Once known to (e.g., registered with) the system, however, a user may conduct value exchanges and other transactions using portable, semi-portable and other computing  
25 devices. In particular, the system enables a user to conduct a secure transaction from his or her client device directly (e.g., to another user or person having a compatibly equipped device) or indirectly (e.g., by describing or submitting the transaction to a system server, which may then notify another transaction party).

Illustratively, in a direct transfer the parties may exchange cryptographic tokens in  
30 order to prevent later repudiation and authenticate the transaction to the system, and, once the system is informed of the transaction by at least one party, the transaction can be closed.

In an indirect transfer the system may contact another party (e.g., by electronic mail or telephone) on behalf of an initiating user and, if the party is not already registered, invite.

that party to register with the system in order to receive and/or conduct their own transfers or exchanges. In one embodiment of the invention the invited party may, of course, be able to satisfy his or her part of the transaction (e.g., receive or pay money or other value) without registering with the system. For example, he may send payment to or receive  
5 payment from the system in a traditional form (e.g., check, credit card, debit card).

With reference now to FIG. 2, an illustrative method of conducting an indirect value exchange transaction according to one embodiment of the invention is presented. The illustrated method is suitable for use with the system depicted in FIG. 1.

In state 200, a first user (USER1) registers with the system, one method of which is  
10 described in a following section. Illustratively, as part of the registration process USER1 provides his or her name and residence/postal address, a meaningful identifier (e.g., electronic mail address, telephone number, social security number) and pertinent financial information. Financial data provided by USER1 may include a credit card or bank account to be credited or charged for individual transactions and/or when the value of a transaction  
15 exceeds a predetermined limit. In particular, users may be assigned limits on how much value they can transfer through the system, based on the financial data regarding them, the degree to which their personal information (e.g., address) can be verified, etc. The limit may affect the size or number of uncleared transactions that a user may be involved in at a given time.

20 A registered user may be assigned an account number or other identifier within the system. As mentioned above, however, a party may be included in a transaction by specifying an externally meaningful identifier (e.g., electronic mail address, telephone number) associated with the party. USER1 may register with the system, and conduct transactions, using virtually any form of client device (e.g., handheld or palmtop computer,  
25 desktop, web-enable telephone) having the ability to communicate with another computing device (e.g., a system server).

In the presently described embodiment of the invention a digital certificate is generated for or provided by USER1 as part of the registration process. Illustratively, a certificate generated for USER1 includes USER1's name and electronic mail address (or  
30 other meaningful identifier) and a public key signed by the system, all of which are encrypted by a code (e.g., a Personal Identification Number or PIN) previously assigned to or chosen by USER1. In one method of registering a user described in a later section, a public/private pair of cryptographic keys is generated (e.g., by the user's client or security

server 110) and the private key is retained only by the client or other computer system operated by the user.

In state 202 USER1 enters a transaction in his client using software provided by the system. Illustratively, USER1 simply enters the electronic mail address, telephone number or other identifier of a party (e.g., USER2) with whom he wishes to exchange value, plus the value to be transferred. In this embodiment, the value may flow in either direction (i.e., from or to USER1). The amount of value that USER1 may transfer (if the value is to flow to USER2) may be limited to his system account balance (e.g., which may be stored on his client and updated when the client synchronizes with the system). This amount may be decreased by any other transfers (to other users) that have been requested or initiated but not yet cleared. If, however, USER1 has provided other payment arrangements (e.g., through a credit card, electronic funds transfer), then he may be able to exceed his account balance.

USER1 may be required to enter a security code (e.g., Personal Identification Number or password) to activate the client system software before entering a transaction. Illustratively, if an incorrect code is entered a predetermined number of times (e.g., ten), the ability to enter transactions may be disabled and USER1 may be required to contact or synchronize with the system (as described below) in order to re-enable the client software.

The software may maintain a list of all parties with whom USER1 has previously conducted a value exchange transaction, in which case he may just select USER2's identifier if she is included in the list. The client system software employed by USER1 may offer multiple transaction options. For example, USER1 may be able to initiate a unilateral transfer to (or from) USER2. USER1 may also be able to initiate a bilateral transaction if his client and USER2's client are capable of direct (e.g., wireless) communication. Yet further, USER1 may be able to transmit the client system software to USER2's client device. In this case, however, USER2 may not be able to transfer value to another party until she registers with the system (and opens an account).

At some time after entering the transaction in his client, in state 204 USER1 synchronizes with synchronization server 106. In particular, USER1 initiates whatever commands or actions are necessary to connect his client with the synchronization server. The client may be able to connect directly, perhaps through a wireless connection, or through any number of intermediate devices or media (e.g., the Internet). In particular, if

USER1's client is a portable device, he may be required to dock it or otherwise connect it to another computer system in order to initiate a connection to synchronization server 106.

Synchronization may be required on a regular basis (e.g., at least once every thirty days). If this requirement is not satisfied, the client software may automatically prevent  
5 USER1 from making payments or initiating transactions. In addition, transactions made on USER1's client may be automatically canceled or nullified if he does not synchronize within a certain period of time (e.g., thirty days) after entering the transaction in the client.

In a typical synchronization process according to one embodiment of the invention, USER1's client connects to synchronization server 106 and identifies USER1 by his system  
10 account number (and/or electronic mail address, telephone number or other meaningful identifier). The server locates a user record for USER1 (e.g., in database 102) and retrieves a code (e.g., a PIN) assigned to or associated with the user. A digital certificate associated with USER1, and which is to be transmitted to USER1 during synchronization, is then encrypted with this code; this digital certificate may be the certificate that was generated  
15 when USER1 was registered. Illustratively, however, the digital certificate may be augmented with one or more transaction certificates for transactions involving USER1 that have been reported to the system by other users. The digital certificate may also be used to pass a new code (e.g., PIN) to USER1.

If there is no digital certificate stored on the system for USER1, the synchronization  
20 server requests USER1's password and electronic mail address (or other identifier). If this information is verified, a new key pair may be generated and a new digital certificate issued.

After the initial synchronization connection is established, the client sends the present transaction (and any others it has stored and not already sent) to the server. The  
25 transactions may be sent using digital transaction certificates, as described above. The client is informed if any previous transactions of USER1 have cleared (e.g., another party in a previous transaction may have connected to the system and accepted the transaction), in which case they may be removed from the client. The server may then prioritize uncleared transactions according to some criteria (e.g., date, time, other party(ies), transaction value,  
30 direction of value transfer).

A user's client (and/or a system server) may maintain a transaction log in which to record transactions conducted by and/or involving the user. An entry is then made in the log when the user initiates a transaction. An entry may also be made in the log for each

transaction (e.g., initiated by another party) that the client learns of from a system server (e.g., during synchronization). Entries may be removed or archived after their associated transactions clear.

In one method of the invention account balances are altered during the synchronization process. In particular, USER1's account is debited for all values being transferred away from USER1. Conversely, however, USER1's account may not be credited for incoming value transfers initiated by USER1 until the other parties to such transfers synchronize or otherwise acknowledge or approve them (e.g., until the transactions clear). If USER1's system account has an insufficient balance to make a transfer (e.g., to USER2), his credit card or other value stream may be tapped (e.g., by financial server 108) to cover them.

Thus, in state 204, once USER1 has connected to the synchronization server the transaction is communicated to the system along with any other transactions not yet submitted. In exchange, the synchronization server may inform the client of any closed transactions and download transactions that involve USER1 that were initiated by other parties. Therefore, the synchronization process of state 204 may involve updating USER1's client and the system with various transactions to which USER1 is a party. Account balances on a system server and/or the client may be altered accordingly during the synchronization process or afterwards.

In state 206 a system server (e.g., synchronization server 106) receives the details of the USER1/USER2 transaction (e.g., including an identifier of USER2 and the value to be transferred). If the value exchange is from USER1 to USER2, USER1's account may be automatically debited by the amount of the transfer; this may require a charge to a credit card or bank account associated with USER1. In the illustrated embodiment, however, account updates may be postponed until a later stage of the procedure.

In state 208 the system attempts to inform USER2 of the transaction. In this embodiment the system uses the identifier submitted by USER1 (e.g., by generating an automated electronic mail message or voice message). If, however, USER2 is a registered system user, her account may be examined to determine if she has a different, preferred, method of receiving transaction communications. If USER2 is not a registered user, the automated message includes details concerning what she should do to receive the value. For example, a system web site hosted by communication server 104 may be identified and USER2 invited to connect to the site and register.



In state 210, which may occur simultaneously with state 208, the system determines whether USER2 is a registered user. If so, then she need not register and the procedure continues at state 214.

In state 212, however, USER2 is unregistered at the time of the transaction with  
5 USER1 and therefore may be required to register before the transaction can be closed, particularly if the value is to be transferred from USER2 to USER1. By registering with the system, USER2 may receive or submit the transaction value using virtually any normal means for conveying value (e.g., credit card, check, debit card, electronic funds transfer). However, in one alternative embodiment of the invention USER2 may not be required to  
10 register. In particular, in this alternative embodiment she may be able to make a one-time payment to or withdrawal from the system (e.g., with a credit card or check).

In state 214 USER2 accepts or acknowledges the transaction. Acceptance may be implied if she was an unregistered party and registers in response to the invitation from the system. State 214 may only be required for transactions in which the value is to be  
15 transferred from USER2 to USER1. In other words, when a first user initiates a transaction to transfer value to another user, the other user's acknowledgement may not be needed. However, if a first user initiates a transaction to receive value from another user, it may be necessary to receive approval from the other user before closing the transaction.

In state 216 the transaction is closed by altering system account balances for USER1  
20 and USER2 according to the value of the transaction. In addition, the user that is providing value to the other party may need to inject additional value into the system in order to cover the transaction. Thus, financial server 108 may charge the user's credit card, conduct an electronic funds transfer or take other action. Further, if there is a limit or maximum on the receiving user's account balance, the financial server may credit value to his or her credit  
25 card, debit card, bank account, etc.

In state 218 the client devices for USER1 and USER2 are updated according to the transaction (and, possibly, other transactions). If, however, USER1 or USER2 are disconnected from the system at the time, their devices may be updated (e.g., by synchronization server 106) the next time they connect. After state 218 the illustrated  
30 procedure ends.

In a present embodiment of the invention USER1 may be granted affinity points or some other reward for introducing a new user to the system. In particular, if USER2 was

not a registered user at the time USER1 submitted the transaction to the system, he may be rewarded if USER2 registers in response to the transaction notification from the system.

The embodiment of the invention illustrated in FIG. 2 and described above is but one method of conducting a value exchange with a system such as that depicted in FIG. 1.

5 This method may be readily modified to accommodate the use of various types of client devices, communication media and communication sequences. In particular, the preceding method may be applied as described, or slightly altered, to conduct a value exchange between a registered user and an unregistered party, between two or more registered users, or in virtually any circumstance in which value is being exchanged.

10 FIG. 3 depicts one form of an indirect value exchange performed by one user on a mobile client device. In FIG. 3 UserA enters the value exchange in her device, ClientA. The transaction is then submitted to a system server, possibly during a synchronization process. The amount of the value (if UserA is authorized to transfer the full value) is removed from UserA's account and UserA's client device is updated with her new account  
15 balance. Additional funds or value may be retrieved from a bank, credit card, ACH, or other financial source associated with UserA if her account balance falls below a minimum level or the transfer is necessary in order to complete the requested exchange. The value is deposited in UserB's account, which may require an account to be created for UserB if he is not already a registered user.

20 In one embodiment of the invention the value of a transaction may be held in escrow. In this embodiment the user initiating the transaction chooses an option to have the value placed in escrow. If this user is the payor (e.g., the party from whom value is being transferred), the user's account may be debited as soon as the transaction is communicated to the system, but instead of being credited to the specified recipient, it is held in an escrow  
25 account. Illustratively, the value recipient is notified that a value is being held and, possibly, the conditions for releasing it. The system may require that both parties agree before the funds are transferred to the recipient or back to the payor. The system may be configured, by default, to complete the transfer after a certain period of time if there is no objection from a party or, conversely, to cancel the transaction unless one or both parties  
30 affirm it within the specified period of time.

The following sub-sections describe methods of conducting a value exchange in different environments or circumstances from those described above.

## CONDUCTING AN ONLINE VALUE EXCHANGE

In one alternative method of conducting a value exchange, a user connects to the value exchange system (e.g., the system of FIG. 1) through an Internet connection (e.g., from a desktop or wireless client). In this method, communication server 104 of the system  
5 of FIG. 1 comprises a web server hosting a web site for the system. A user wishing to initiate a transaction connects to communication server 104 and satisfies the necessary security requirements by providing a username, account name or other identifier (e.g., electronic mail address, telephone number) and a password. In one alternative of this embodiment, a cryptographic security policy may be enforced that requires the user to  
10 provide cryptographic authentication or a security token.

The user completes an online form by providing information such as an identifier (e.g., electronic mail address, telephone number, social security number, account name) of another party to the transaction and the value to be transferred. Also, the user may specify whether the value is to be transferred from him to the other party or vice versa. The user's  
15 interface with the system (e.g., the web page presented to the user when he connects or logs in) may be personalized to the user. In particular, identifiers of parties with which the user has transacted in the past may be available for ready selection, in which case the user need not remember or enter an identifier but can, instead, pick one from a list.

If the other party is already a registered system user, the system may then proceed to  
20 conduct the value transfer. Illustratively, if the value is to flow from the initiating user to the other party, the system may not require the approval or authorization of the other party to finalize or close the transaction. The system may simply send notification of the transaction (e.g., via electronic mail) to the party. In contrast, if the value is to flow from the other party to the initiating user, the system may require the other party's approval  
25 before closure. When the value of the transaction flows from the initiating user to the other party, the user's account may be debited by the amount to be transferred even before the transaction closes (e.g., before the other party accepts the transaction).

If the other party is not a registered system user, the system notifies the party of the pending transaction by using the identifier provided by the initiating user. The notification  
30 may thus be sent via electronic mail. Illustratively, the notification identifies the user who initiated the transaction, informs the other party of the amount of the transaction and specifies how/where (e.g., a web page or site) to complete the transaction. In order to receive the value or submit the value requested by the initiating user, the other party may

then connect to the system and register. A method of registering a new user is described in a following section.

Unlike an offline transaction (e.g., using a disconnectable portable computing device), when conducting a transaction online a user may be able to access account  
5 information and/or close the transaction in real time.

The method of the invention described in this sub-section is suitable for application with clients that can establish and maintain a real-time link with the system, whether through the Internet via a wired or wireless connection, through a telephone connection (wired or wireless), etc.

10

#### CONDUCTING A DIRECT (CLIENT TO CLIENT) VALUE EXCHANGE

In one alternative embodiment of the invention a method is provided in which two parties employ their client computing devices to conduct a value exchange. If they are disconnected from the system while conducting the transaction, after the transaction one or  
15 both of them submit the transaction to the system (e.g., via communication server 104 or synchronization server 106 of the system of FIG. 1). This method is particularly suited to the use of mobile computing devices and smart or web-enabled telephones that can communicate directly (e.g., via a wired or wireless communication medium) with another client.

20 The option to conduct a client-to-client transaction may be just one of several options available to a user. For example, the system software installed on the client device may also enable one user to transmit the system software to another user, conduct a unilateral transaction (e.g., as described above in conjunction with FIG. 2), view his or her account balance(s) (which are updated each time the client is synchronized) or transaction  
25 log, use a calculator, etc.

If the user elects to make a client-to-client transaction, the user's client may automatically attempt to establish contact with another client. The client may be configured to make such connections in a wireless or wired mode.

In this method each user activates his or her computing device and one of them  
30 operates the installed system software to initiate a payment to or from the other user. This may require the user to enter a Personal Identification Number (PIN) to activate the software. The other user's client may then prompt him or her to accept or reject the transaction, particularly if the value of the transaction is to be transferred from the other

user to the first user. If only one user has the software installed, the software may be transmitted to and installed on the other user's device as part of, or as a precursor to, the transaction.

Illustratively, the account balance of the user giving the value (e.g., as indicated in the system software) decreases when the transaction is conducted. Closing the transaction may require the paying user's credit card, debit card or other method of providing value to the system to be charged (e.g., if his or her account balance is too low). The transaction may not be closed until one of the users forwards the transaction to the system (e.g., during a synchronization session with synchronization server 106). The client software may allow a user to make notes or comments to be saved in a transaction log with the details (e.g., value, other user's identifier) of the transaction.

In one method of conducting a direct value exchange, the users may exchange digital certificates (e.g., transaction certificates) or other tokens in order to authenticate each other and/or demonstrate to the system that the transaction is valid and was not spoofed or faked by one of the parties.

FIG. 4 depicts one form of a direct value exchange performed between two users having mobile client devices. In FIG. 4 UserA electronically transfers the value from her ClientA to UserB's ClientB. The transaction is then submitted to a system server by one of the transaction parties, possibly during a synchronization process. The amount of the value (if UserA is authorized to transfer the full value) is removed from UserA's account and deposited in UserB's account. Additional funds or value may be retrieved from a bank, credit card, ACH, or other financial source associated with UserA if her account balance falls below a minimum level or the transfer is necessary in order to complete the requested exchange. Both of the users' client devices are updated with their new account balances.

#### Canceling a Value Exchange

In various situations a user may wish or need to reverse or cancel a value exchange. For example, while attempting to conduct a transaction with another party a user may provide an incorrect identifier – such as a non-existent or invalid electronic mail address or a valid electronic mail address that is associated with someone other than the desired party. In one embodiment of the invention a value transfer may be undone if the situation warrants. In particular, if it is determined that an exchange should be undone, the system

may cancel the value transfer, reverse it, redirect it (e.g., transfer the value to a third party) or nullify it in some other manner.

If an identifier of a transaction party (e.g., electronic mail address) provided by a user is unusable (e.g., invalid), the user may specify whether to reverse or redirect the transfer or the system may apply a default action (e.g., return the value to the user). This situation may occur, for example, if an electronic mail notification of the transaction to the other party is undeliverable (e.g., incorrect address, party's electronic mail server is unavailable).

If the party identifier is a valid identifier, but is not associated with the intended party, rectifying the situation may be more difficult. For example, if the transaction has already been closed and the value credited to the incorrect party, the transaction may be irreversible. The initiating user may, of course, contact that party and attempt to retrieve the value.

If the party identifier is valid but is not associated with the intended party and the transaction has not yet closed, the user may be able to retrieve the value. Some period of time (e.g., six months) may be established for automatically canceling or reversing uncleared transactions or during which the user may request cancellation of the transaction. For example, if a user initiates a transaction and six months later the recipient still has not claimed the value, the system may automatically reverse or cancel the transfer. Before that time, however, the initiating user may have to request the transaction be nullified. The system may attempt to contact the incorrect party before doing so.

#### **Registering a New User in One Embodiment of the Invention**

As described earlier, in one embodiment of the invention a user must be registered with the value exchange system before being able to initiate or close a transaction with the system. This section describes one method of registering a new user, during which the user may download or otherwise receive software configured to allow the user's client device to interact with the system and/or other user's clients.

Illustratively, a new user may register with the system in many ways, such as through a system web site, via a web-enabled telephone, via normal voice telephone contact, via electronic or normal mail, etc. The level of access or degree to which a user may employ the system after registration may, however, depend upon how the user registers, how much information is provided during registration, how much of the

information is verified, etc. For example, if a user-provided telephone number, electronic mail address, street address, and/or other information is all verified, the user may be granted greater system access or be allowed to conduct transactions involving more value than if the information is incorrect, unverifiable or not provided.

- 5 In one embodiment of the invention a potential new user connects to communication (e.g., web) server 104 of the system of FIG. 1 and completes a registration form. Advantageously, the registration process is done in a secure mode (e.g., with SSL (Secure Sockets Layer)). The registration form may elicit or require personal information such as name, residential (e.g., street) address, telephone number(s) (e.g., daytime,
- 10 nighttime, mobile), etc. Information to be associated with the user's account is also requested, such as an electronic mail address, social security number, some information that may be used for security purposes (e.g., mother's maiden name), etc. The user may also be prompted to enter a password to be used for the new account and/or a PIN (Personal Identification Number) for activating system software on the user's mobile device.
- 15 Illustratively, when the user wishes to initiate or accept a transaction while using his mobile device, he may be required to enter the PIN before the software will function.

- The user may be required to agree to specific terms for using the system. The system may then attempt to verify one or more pieces of information provided by the user. Thus, a confirmation communication may be sent to the user's street address, electronic
- 20 mail address, mobile device, etc. A confirmation communication may include a code (e.g., a PIN) that the user is instructed to provide to the system (e.g., web server 104) in order to complete or continue the registration process.

- In an embodiment of the invention in which a new user registers with the system using a smart or web-enabled telephone, the registration process may be tailored to the
- 25 device and the limited display means of such a device. Thus, some of the registration information (e.g., telephone number, name) could be derived from the telephone or the signal received from the telephone. And, the information required of the user may be reduced to a minimum if it must be entered through the telephone's keypad.

- Illustratively, some of the information associated with a system user may be
- 30 required to be unique. For example, in an embodiment of the invention in which transaction participants may be identified by their electronic mail addresses, the system may require a one-to-one mapping between addresses and users. In another embodiment users may be identifiable by telephone numbers. Again, the system may allow each

telephone number to be associated with only a single user, although extension numbers could, perhaps, be added to differentiate between multiple users reachable at one number. One reason for this limitation is to allow a value exchange participant to identify another participant using a common identifier that is, or may be, already known. In one alternative  
5 embodiment, however, a user may be known by an account number or other identifier generated by or for the system. In another alternative embodiment, some or all users may be identified by multiple identifiers, in which case multiple users may be associated with a particular identifier (e.g., electronic mail address) but also have other identifiers that distinguish them.

10 After a user is registered with the system, he or she may then establish an initial and/or default method of providing funds. For example, the user may identify a credit card, a bank account, a debit card or other source of value to be charged when the user transfers value to another person or at other times when value must be added to the user's system  
15 account. The amount of system credit or the limit placed on the user's system activity may be determined in part or in whole by the form of value transfer the user employs, the level of credit or value transfer authorized by the user's financial institution, the degree to which the user's personal or account information has been verified, etc. For example, if the user's street address cannot be verified (e.g., he or she does not submit the code mailed to the  
20 address they provided), or the address of his/her credit card does not match his/her mailing address, or the user's credit card limit is low, then he or she may be limited to a first level of system usage. If, however, the user's personal or financial information is verified and/or their credit card limit is relatively high, he or she may be allowed to transfer much more  
25 value through the system. In short, the level of trust, authentication, verification or security that the user provides to the system may affect the amount or level of system usage the user is granted.

Until a user submits credit or debit information his or her system limit may be kept at zero, indicating that he or she is not authorized to transfer value to other parties. The user may, however, be able to receive value transfers as soon as he or she is registered.

30 A user may also be able to place value in his or her system account through direct deposit, a personal check, electronic funds transfer, etc. Illustratively, however, funds submitted via these methods are not available for transfer until they clear. Users may choose multiple methods of depositing value into their accounts (and retrieving value from



their accounts) and may be required to provide whatever information is necessary (e.g., bank routing or account number) to implement those methods.

Registration may or may not be required before a user can download and install software configured to allow a user to make a value exchange. A software download may  
5 be part of the registration process or may, alternatively, be conducted before or after a user registers. The following is a description of a software download/installation process according to one embodiment of the invention.

To receive the software the user first connects his client device to an appropriate system server (e.g., communication server 104 or synchronization server 106 of the system  
10 of FIG. 1). The user makes a choice to download the software and may need to identify his or her device so that the correct software is provided. A registered user may also identify himself to the system, in which case the system may automatically determine (e.g., by communicating with the user's device or referring to account information in database 102) whether the user needs to update his software.

15 The software that is downloaded may depend upon the user's normal or expected method of accessing the system. For example, if the user employs a portable device the downloaded software may be tailored to the particular device to allow it to communicate and interact directly with the system. If the portable device is a disconnectable device that must be docked with or otherwise connected to another computer system (e.g., a desktop or  
20 workstation, herein termed a "conduit" computer) in order to communicate with the system, then the downloaded software may include modules for the disconnectable device and/or the other computer system.

The appropriate software is then copied to the user's device. Other software, perhaps provided by a manufacturer or vendor of the user's device may need to be in  
25 operation in order to fully install the system software. For a disconnectable portable computing device, a first software module is installed on the conduit computer, after which the device may be docked in order to install a second module on the device. The first module may be configured to synchronize the user's locally stored data and information with synchronization server 106, while the second module may be configured to conduct  
30 disconnected transactions and communicate them to the conduit computer. Thus, after a transaction is conducted with the client while disconnected, it is communicated to the conduit computer, which then synchronizes with synchronization server 106. The client software module may be considered a "wallet" application.

- Illustratively, after new software is downloaded, and before the user can use his portable device to transfer value to another person, he must be authenticated to the system. Thus, in one embodiment of the system the user inputs his username (e.g., account name, electronic mail address or other system identifier) and password, which the conduit passes
- 5 to the system (e.g., synchronization server 106, security server 110) for verification. If the user is verified, a pair of cryptographic keys may be generated (e.g., by the conduit computer or security server 110). In the presently described embodiment the user's conduit computer generates the key pair and passes the public key to the system to be signed. The signed key may be returned in encrypted form (e.g., encrypted with the user's PIN).
- 10 Illustratively, both the private key and signed public key are then stored only on the user's portable device (i.e., not on the conduit).

- When a user installs new software (e.g., a new version), uncleared transactions may be automatically cleared (with synchronization server 106) or archived. If the user installs new software on a different device, the digital certificate on the original device may be
- 15 invalidated.

- The foregoing descriptions of embodiments of the invention have been presented for purposes of illustration and description only. They are not intended to be exhaustive or to limit the invention to the forms disclosed. Accordingly, the above disclosure is not
- 20 intended to limit the invention; the scope of the invention is defined by the appended claims.

**What Is Claimed Is:**

1. A method of facilitating a value exchange between multiple users in a distributed value exchange system, the method comprising:
  - 5 (a) registering a first user with the value exchange system;
  - (b) receiving a value exchange transaction from the first user, wherein said transaction involves a second user and includes:
    - 10 (i) a pre-existing identifier of the second user, wherein the pre-existing identifier enables communication with the second user independent of the value exchange system; and
    - (ii) a value to be exchanged between the first user and the second user;
  - (c) notifying the second user of said value exchange transaction; and
  - (d) allocating said value between the first user and the second user.
2. The method of claim 1, further comprising:
  - 15 (c') registering the second user with the value exchange system if not already registered.
3. The method of claim 1, wherein said value to be exchanged between the first user and the second user is to be transferred from the first user to the second user.
4. The method of claim 1, wherein said value to be exchanged between the first  
20 user and the second user is to be transferred from the second user to the first user.
5. The method of claim 3, wherein said value to be exchanged between the first user and the second user is receivable by the second user as a redeemable voucher.
6. The method of claim 5, wherein said redeemable voucher is redeemable by the second user by selecting an electronic link provided to the second user.
- 25 7. The method of claim 5, wherein the redeemable voucher includes an electronic advertisement.

8. The method of claim 3, wherein said value to be exchanged between the first user and the second user is receivable by the second user through a debit card.

9. The method of claim 3, wherein said value to be exchanged between the first user and the second user is receivable by the second user in the form of a web certificate,  
5 and wherein the method further comprises:

transferring said value to be exchanged between the first user and the second user from the second user to a third user.

10. The method of claim 1, wherein said pre-existing identifier is a telephone number.

10 11. The method of claim 1, wherein said pre-existing identifier is an electronic mail address.

12. The method of claim 1, wherein said receiving a value exchange transaction comprises:

initiating a value exchange involving a second user on a mobile client device of said  
15 first user;

establishing a connection between the first user and the value exchange system; and transmitting said value exchange to the system.

13. The method of claim 12, wherein said initiating a value exchange transaction comprises establishing a communication link between the first user's mobile  
20 computing device and a second user's mobile client device.

14. The method of claim 1, wherein said value exchange transaction is received from the first user through a mobile communication device.

15. The method of claim 14, wherein the mobile communication device is a personal digital assistant.

25 16. The method of claim 14, wherein the mobile communication device is a

telephone.

17. The method of claim 14, wherein the mobile communication device is a two-way pager.

18. The method of claim 14, wherein said value exchange transaction is  
5 received from the mobile communication device through a wireless network.

19. The method of claim 14, wherein the mobile communication device is a disconnectable device.

20. The method of claim 1, further comprising converting said value to be exchanged between the first user and the second user from a first form to a second form.

10 21. The method of claim 20, wherein said first form is a first currency and said second form is a second currency.

22. The method of claim 1, wherein the form of said value to be exchanged between the first user and the second user depends on the pre-existing identifier.

23. The method of claim 1, further comprising holding said value to be  
15 exchanged between the first user and the second user in escrow with an escrow party until said value exchange transaction is completed.

24. The method of claim 1, further comprising repeating (b), (c) and (d) for a second value exchange transaction between the second user and a third user.

25. The method of claim 1, wherein an asymmetric cryptographic scheme is  
20 applied to secure said value exchange transaction.

26. A method of facilitating an exchange of value between multiple users through a distributed transaction system, comprising:

(a) receiving an instruction from a first user to exchange a value with a second

user, wherein the first user is a registered user of the distributed transaction system and the instruction includes:

- 5           (i)     an identifier of a second user not registered with the distributed transaction system, wherein said identifier is usable to identify the second user independently of the distributed transaction system; and
- (ii)     the value to be exchanged between the first user and the second user;
- (b)     notifying the second user of said value exchange;
- (c)     registering the second user with the distributed transaction system; and
- (d)     transferring said value between the first user and the second user.
- 10       27.     The method of claim 26, wherein said identifier is an electronic mail address.
28.     The method of claim 26, wherein said identifier is a telephone number.
29.     The method of claim 26, wherein said instruction is received through a mobile communication device operated by the first user.
- 15       30.     A method of facilitating a financial transaction between a first user and a second user through a distributed financial services system, the method comprising:
- (a)     registering a first user with the distributed financial services system;
- (b)     receiving a financial exchange request from a mobile communication device
- 20     operated by the first user, wherein said financial transaction request includes:
- (i)     a pre-existing identifier of a second user participating in said financial exchange, wherein said pre-existing identifier is configured to identify the second user for a purpose other than conducting a financial exchange with the financial services system; and
- 25           (ii)     an amount of the financial exchange;
- (c)     notifying the second user of said financial exchange request; and
- (d)     allocating said amount of said financial exchange between the first user and the second user.

31.     The method of claim 30, wherein said pre-existing identifier is an electronic

mail address.

32. The method of claim 30, wherein said pre-existing identifier is a telephone number.

33. The method of claim 30, further comprising:

5 (c') registering the second user with the distributed financial services system before allocating said amount of said financial exchange.

34. A value exchange system for exchanging value between multiple users, comprising:

10 a database configured to store information concerning registered users of the value exchange system and details of transactions conducted by the registered users;

a synchronization server configured to receive a first value exchange transaction from a client device operated by a first party, wherein said first value exchange transaction involves a second party identified by the first party with an identifier that is capable of  
15 identifying the second party independently of the value exchange system; and

a communication server configured to receive a connection from the second user and register the second party if not already registered.

35. The system of claim 34, further comprising a financial server configured to  
20 interact with a financial institution to access value to facilitate said first value exchange transaction.

36. The system of claim 34, further comprising a security server configured to generate a digital identity certificate that may be used to authenticate the first party.

37. The system of claim 36, wherein said security server is further configured to  
25 authenticate a digital transaction certificate that may be used to authenticate said value exchange transaction.

38. The system of claim 34, wherein said identifier is one of an electronic mail address and a telephone number.

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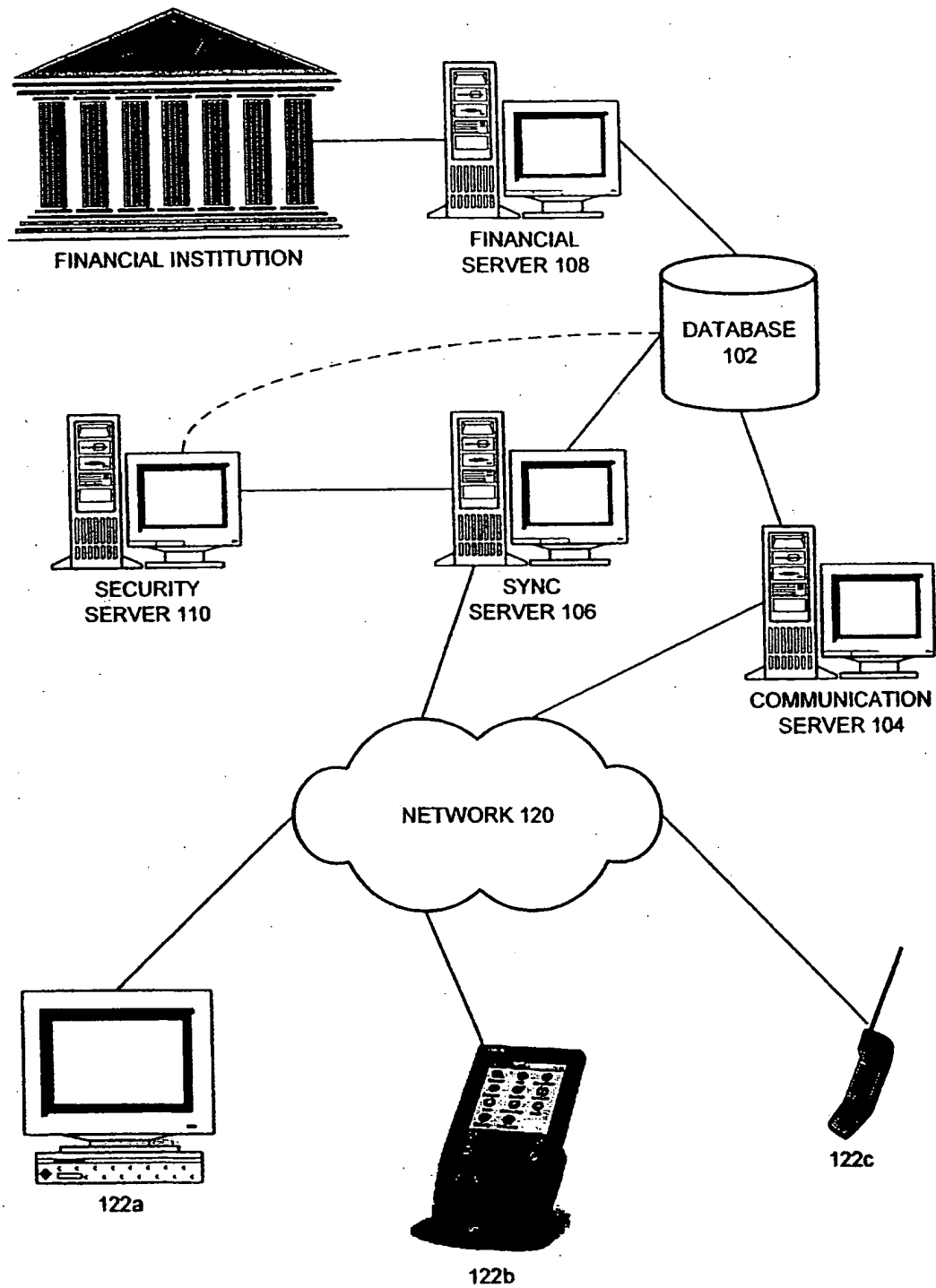


FIG. 1



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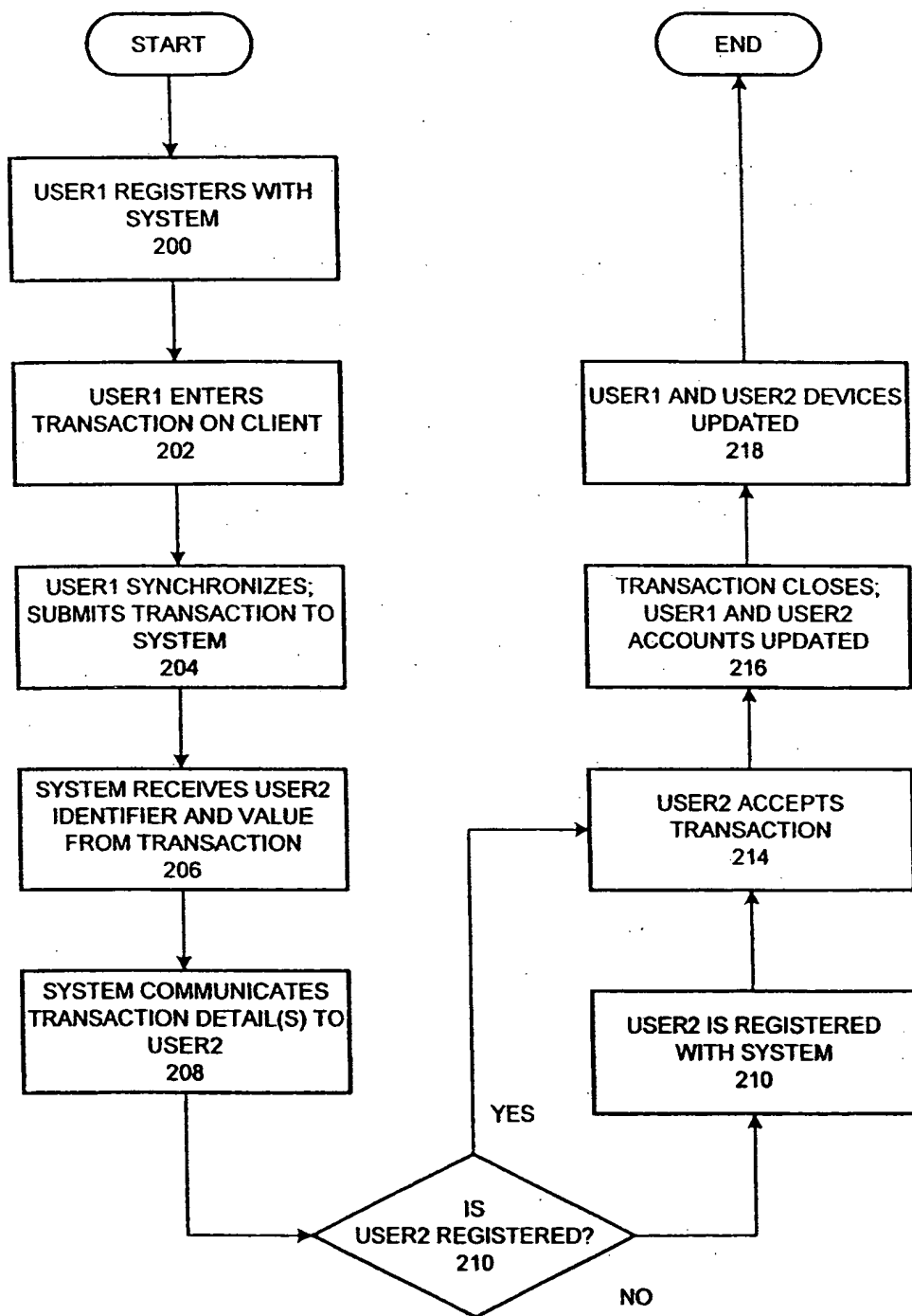


FIG. 2

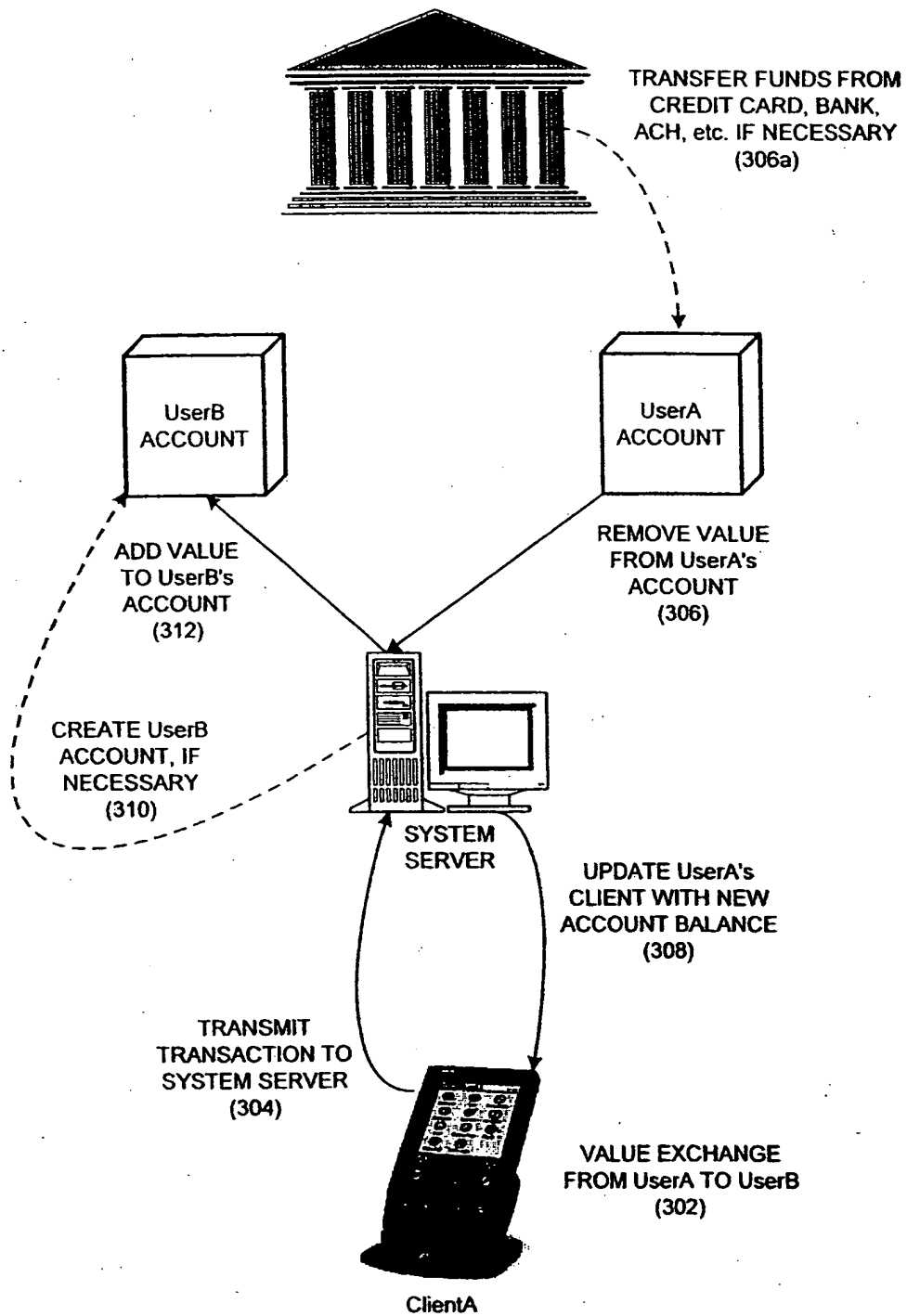


FIG. 3

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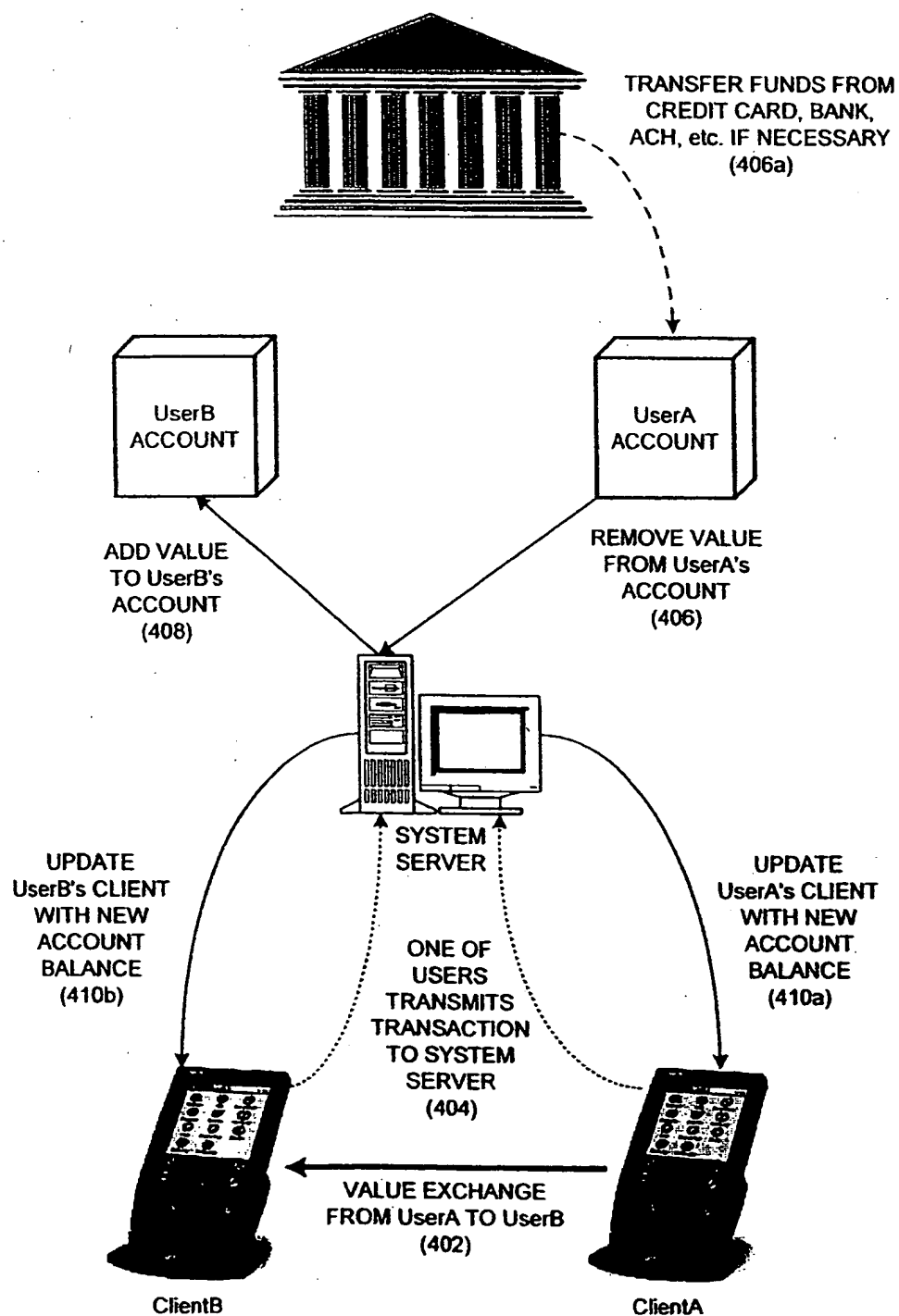


FIG. 4

REVISED VERSION

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
9 November 2000 (09.11.2000)

PCT

(10) International Publication Number  
**WO 00/67177 A2**

(51) International Patent Classification<sup>7</sup>: G06F 17/60

(21) International Application Number: PCT/US00/11732

(22) International Filing Date: 28 April 2000 (28.04.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/131,785 30 April 1999 (30.04.1999) US  
60/144,633 19 July 1999 (19.07.1999) US  
60/172,311 17 December 1999 (17.12.1999) US

(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with declaration under Article 17(2)(a); without abstract;  
title not checked by the International Searching Authority

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(48) Date of publication of this revised version:  
22 November 2001

(15) Information about Correction:  
see PCT Gazette No. 47/2001 of 22 November 2001, Section II

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 00/67177 A2

(54) Title: SYSTEM AND METHOD FOR ELECTRONICALLY EXCHANGING VALUE AMONG DISTRIBUTED USERS

(57) Abstract:

# PATENT COOPERATION TREATY

# PCT

## DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT

(PCT Article 17(2)(a), Rules 13ter.1(c) and Rule 39)


Applicant's or agent's file reference <b>X00-001PCT</b>	IMPORTANT DECLARATION	Date of mailing(day/month/year) <b>08/03/2001</b>
International application No. <b>PCT/US 00/ 11732</b>	International filing date(day/month/year) <b>28/04/2000</b>	(Earliest) Priority date(day/month/year) <b>30/04/1999</b>
International Patent Classification (IPC) or both national classification and IPC <div style="text-align: right;">g06f17/60</div>		
Applicant <b>X.COM CORPORATION</b>		

This International Searching Authority hereby declares, according to Article 17(2)(a), that **no international search report will be established** on the international application for the reasons indicated below

1. ☐ The subject matter of the international application relates to:
  - a. ☐ scientific theories.
  - b. ☐ mathematical theories
  - c. ☐ plant varieties.
  - d. ☐ animal varieties.
  - e. ☐ essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes.
  - f. ☐ schemes, rules or methods of doing business.
  - g. ☐ schemes, rules or methods of performing purely mental acts.
  - h. ☐ schemes, rules or methods of playing games.
  - i. ☐ methods for treatment of the human body by surgery or therapy.
  - j. ☐ methods for treatment of the animal body by surgery or therapy.
  - k. ☐ diagnostic methods practised on the human or animal body.
  - l. ☐ mere presentations of information.
  - m. ☐ computer programs for which this International Searching Authority is not equipped to search prior art.
  
2. ☐ The failure of the following parts of the international application to comply with prescribed requirements prevents a meaningful search from being carried out:
 

☐ the description
☒ the claims
☐ the drawings
  
3. ☐ The failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions prevents a meaningful search from being carried out:
 

☐ the written form has not been furnished or does not comply with the standard.
   
☐ the computer readable form has not been furnished or does not comply with the standard.
  
4. Further comments: see further info

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  <b>Lucia Van Pinxteren</b>
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 203

The subject matter claimed falls under the provisions of Article 17(2)(a)(i) and Rule 39.1(iii), PCT, such subject-matter relating to a method of doing business.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

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